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Geography and Landscape

Address to the Geographical Association

P. W. BRYAN

President 1957

MY FIRST OBJECTIVE IN THIS PAPER is to stress the fact that to me the essential core of geography is the relationship between human activity and the physical setting or stage upon which human activity takes place. Secondly that this relationship itself is expressed in the landscape which results from the changes and adaptations of the physical background made by man in his efforts to satisfy his needs. And lastly that with the study and interpretation of this changed landscape as its central feature geography has a distinctiveness of outlook as a whole which marks it off from other subjects.

Landscape, the dictionary tells us, is a portion of land or territory which the eye can comprehend at a single view including all the objects it contains. By extension we can expand the word landscape to include a whole series of contiguous areas so that the word can be used to describe the surface of any area that can be seen. Landscape then means to me the surface of the earth with all the things we see on it.

I began to think in this way of landscape nearly fifty years ago when I went to study at the London School of Economics. I was then, I suppose, a physical geographer and submitted for the certificate in geography a thesis on the glacial lakes of northeast Wicklow. In studying economics I found that this subject was primarily concerned with values in relation to the production and distribution of the commodities which man needs. From the earth's surface or from under it man gets all those products which are required to satisfy his material needs, and in some cases he gets products and uses areas to satisfy or help to satisfy his social, aesthetic or even spiritual desires, as for example when he quarries stone to build a church. To satisfy his needs in this fashion man has to change the surface of the earth and nature limits or conditions the character and extent of the change. He makes fields and hedges, roads, canals and railways, mines and factories, villages, towns and ports, creating thereby a very radical change in the appearance of the landscape. We may say then that all these efforts of man are or were at some time expressed in the landscape. There is or has been in the landscape at any given time a record of his efforts. In many parts of the country these changes form a major part of the landscape. There are still parts of the earth's surface, however, which up to the present man has failed to change to any appreciable extent.

► Professor Bryan delivered his address at the London School of Economics on 31st December, 1957, during the Annual Conference of the Association.

We can then divide landscape very broadly into two types: the natural or physical landscape, i.e., the landscape which has been produced by physical forces such as earth movements, changes in climate, weathering due to wind, frost and rain with the subsequent production of soils, the action of the sea in cutting marine erosion platforms, and the slow growth of vegetation, the primitive beginnings of which can be seen in the sand-dunes along our coasts. This type of country to-day forms a comparatively small part of a region like the British Isles, although in other parts of the world it still covers extensive areas. The other category of landscape is the landscape which has been changed and modified as a result of human action—and possibly 80 or 90 per cent of these changes have been actuated by man's economic needs.

Let us spend a few minutes examining briefly a few of the landscapes one could see on a trip from the north coast of Norfolk to the Midlands. Near Overy Staithe we can look out northwards over sand-dunes, sea and sky, and here man has not made any visible change in the conditions produced by natural forces. South of the sand-dunes are saltings, the salt marsh flooded by the tidal sea. Part of these saltings to the east have been reclaimed by man. A bank consisting of chalk boulders and silt has been built out from the chalk mainland to the dunes thus shutting off from the sea part of the saltings, which have been converted into good grazing land and some fresh-water marsh. Sluice gates have been fitted under the bank to prevent flooding by the rising tide and to provide drainage on the falling tide. Passing inland along the bank we approach what is locally known as the "hard" where a chalk mass covered with gravel forms a landing place for small sailing craft and in the past for trading vessels. The "hard" here and Overy Creek through the saltings where Nelson is said to have made his first contact with the sea determined the siting of the little village of Overy Staithe. In the village are houses built of chalk and flint—the most accessible materials for building on this coast.

If we take a big jump from here westward into the middle of the Fenland we find a region which was at one time marsh and swamp with an occasional island of silt or gravel rising slightly above the general water level. To-day Fenland, as a result of extensive drainage operations carried out over many centuries, forms the largest area of high-grade arable land in this country. It contains over three-quarters of a million acres of the finest land we have for growing wheat, potatoes and sugar-beet. It is perhaps the most striking and radical change in the natural landscape over a large area that man has effected in Great Britain.

Moving west again to the edge of the Fen we reach Cambridge, and on the backs behind King's College everything you can see has been produced or radically altered as a result of human activity in response to what was partly an aesthetic desire to produce a beautiful setting

for a centre of higher education—the lawns, the channel in which the Cam is confined, the bridge, the trees, the college—so that here there is nothing of the original landscape left except the water of the Cam and the sky.

Perhaps the change is even more strikingly seen in a Midlands garden. When I first came to Leicester in 1922 what is now a garden was a very rough piece of field. Work carried on for 35 years has produced quite a change. There are in the garden numerous dahlias. One called *Andries Bonum* appears at first sight to be a natural product. It is not: it is the result of breeding and selection carried on by men over a long period of time and it bears little resemblance to the plant from which it originated. On another called *Amun Ra* some insects have settled and they are the only purely natural thing about it. Again *Michaelmas* daisies in the garden are the result of the same human process of breeding and selection but settled on the surface we might see a beautiful butterfly. Here I am sure we all rejoice that man has produced no change. It is very doubtful if he could ever produce anything so beautiful as the butterfly poised on the surface of the flower.

In this brief survey from the coast of Norfolk to the Midlands we have seen nature at one end of the scale unchanged by man, and at the other a garden in which nothing remains of the original natural scene except the butterfly and the sky.

This landscape, changed and modified as a result of human action, is now called by many the cultural landscape. The term is based not in the more general use of the word culture to indicate refinement and aesthetic values but in the older sense in which we speak of primitive culture when we have in mind the characteristic visible features pertaining to the general life of a people. In this sense it is used by the Ordnance Survey for all features other than physical features shown on a map—fields, houses, mines, quarries, roads, railways, bridges, and so on. Hence cultural landscape seems a useful term to apply to all that part of the landscape which has been changed as a result of human action.

Now if I have made my points clear so far you will realize that what is actually happening in each area to-day and has happened all down through history is that man is modifying or changing the face of nature and nature is limiting and conditioning the extent of that change. The cultural landscape therefore expresses the relationship which exists between man in his efforts to satisfy his wants and the physical setting in which he carries on his activities. The change may be actuated by an economic, a social, a political, or even an aesthetic or a spiritual stimulus, but probably the stimulus in 80 or 90 per cent of the changes brought about is economic in its origin. A field of corn may be considered as an expression of man's relationship to nature in the effort to get food; and a stone-built farm in the Lake District is in part an expression of his need for shelter made possible through his utilization of the

local stone near Keswick for building material. To my mind the observation of the cultural landscape in the field is the starting point of geographical study and when we follow that up with the interpretation of the observed landscape then we are dealing with the real core of geography. Geomorphology, climatology, geology, economics are ancillaries which contribute to that interpretation.

The character of the cultural landscape depends primarily on the character of the physical setting within which human activity to satisfy human needs has developed. It depends in the second place on the kind of activity that can be carried on in a given physical setting. Thirdly and closely related to the above, it depends on the comparative human effort involved in producing a commodity in two differing physical settings. A very extreme case would be cotton in the southern U.S.A. against cotton in glasshouses in England. Fourthly, it depends on the historical element or the time-period during which changes in the landscape have been taking place. Fifthly, it depends on the state and progress of human knowledge and invention.

Now if we turn back to the natural landscape for a few minutes we note that its extent in Great Britain is very limited. Parts of the mountain lands of Wales, the Lake District, the south-western peninsula and the Scottish Highlands are still in their original natural condition only very slightly modified at certain points by man.

Here to avoid any possible misunderstanding may I pause for a moment to say quite definitely that a sound knowledge of the physical background is essential to any interpretation of the cultural landscape. The danger here is that a student may become so fascinated by his studies of the interesting physical processes as to forget that he is studying only a part of the subject and to neglect the core of the subject—the cultural landscape—which gives to geography a unity and wholeness in its own right.

High up on the side of Glen Sannox in the island of Arran are great corries (Plate I) due to the action of the ice which once covered the island, and serrated edges probably made by local glaciers eating back on opposite sides of a ridge. Here the scene is almost entirely natural except for rough tracks made by walkers, hikers, rock climbers or others interested in wild scenery, for in Northern Arran there are fourteen peaks over 2,000 feet and many of the slopes are too steep even for sheep.

On the mainland of Scotland the great peak of Ben More in the western highlands towers above Glen Falloch. The steep slopes, the thin soil, the severe winters, make the area of little use to man except for a few sheep and highland cattle at the lower levels. Farther north beyond Tyndrum we are in one of the higher glens of the Highlands. The little settlement of Bridge of Orchy is on the main road which runs north across Rannoch Moor and drops steeply down Glencoe to the western sea. Bits of the old road—very difficult and very dangerous—can still be seen in the glen. Except for running sheep and the small

area occupied by the road the bulk of the land is useless to man. Small crofts as on Falloch Moor have been laboriously reclaimed from the boggy surface. Such a croft is merely a dry place where the farm can be carried on and sheep assembled. The shepherd and his dogs are features common to this kind of country, and the sheep are the famous Scottish Blackface breed—tough, hardy and able to endure conditions at this high level. They are brought down periodically to lower levels for treatment and shearing. But the number of people who can win a livelihood from such country, swept by the great snowstorms of winter, is very small in relation to the total area involved. In mountain valleys as in the upper portion of Langdale, the enclosed land, which is chiefly used for grazing, ceases as soon as the slope becomes steep. Below the edge of the fells small stone-built farms are found which run sheep on the open moor above.

In all these areas the natural landscape is more or less dominant. Here man has had in the past a very tenuous hold and the extent to which he has altered or changed the surface is relatively slight, but modern developments in forestry, agricultural science and hydro-electric power are helping him to overcome nature's limitations.

If we turn from these areas where occupation of the land is scanty and spasmodic we find in one area in England at 1,000–1,300 feet above sea level on the southern plateau of the Pennines a region where occupation is mostly continuous. Here the relatively flat surface, the underlying limestone formation, and the heavy rainfall of up to sixty inches per annum, give rise to a rich grass feed, and the area has been developed for dairy farming. Many of the farms are small with small fields separated by limestone walls. The high winds are inimical to hedges. Milk platforms mark the junctions of the farm roads and the main road. The region supplies man with milk, meat and leather, and from underground he gets limestone for cement.

In the wetter lowlands of Wales the landscape is again one of cattle farming and this is also the landscape of much of the clay-covered lowlands and flood plains of the Midlands.

In Great Britain much of the surface in the centre and west is enclosed for grassland but as we move southeast and reach the stone belts the landscape changes. In the Market Harborough area of Leicestershire is the rich clay grassland for which the area is famed but to the east the rising ground on the skyline is highly cultivated. This is the beginning of the Jurassic marlstone scarpland, where the lighter soils and better drainage among other factors make the landscape one of arable farming. From here to the coast the landscape is in the main one of ploughing, seeding, harrowing, harvesting and threshing. From the cultivated fields separated by hedges man gets wheat, barley, oats, potatoes, sugar-beet and other valuable crops.

The stone belt also illustrates rather picturesquely the use of stone as building material before modern transport made brick and slate

available almost everywhere. The marlstone used in the villages of east Leicestershire and Northamptonshire has at times an amazing richness of colour which gives a certain aesthetic value to the buildings in which it is used. The stone buildings, flint and chalk, found in the line of villages between the slope of the Chalk and the sea on the north coast of Norfolk are drab by comparison. All these stone buildings contrast sharply with the half-timbered brick or cob cottages of the clay lands where stone was remote and difficult to import. In Aberdeen stone is used still, even for new buildings, as it is readily available from a large and deep quarry on the outskirts of the city.

The cultural landscape of to-day can perhaps be thought of as a palimpsest, that is as an ancient piece of vellum or parchment from which the original writing has been to some extent scratched out or erased but can still be in part deciphered. Stone circles are among the earliest of these partly erased features. They were probably built for religious exercises by the people who belonged to the Megalithic culture about 1900 or 2000 years B.C. A chambered tomb such as Cromlech Arthur on St. David's Head in Pembrokeshire is a partly erased feature of the same or a slightly later period recording possibly the burial of a great leader of the past.

The small fields and stone boundaries found on the Pliocene marine erosion surface near Zennor in Cornwall possibly go back to 400 or 500 B.C. and were made by people of the Iron Age. The foundations of the hut circles on Bodmin Moor are possibly of the same date. The rough edges of the Fowey stream are due to the tailings left by the Cornish stream tanners before the Christian era.

While many of the lines of the great Roman roads are still followed by modern roads some may now be traced in the landscape only as grassy tracks between hedges. This is largely true of the old Via Devana or Gartree road which ran from Leicester to the Roman station at Colchester. Professor Tansley has written of the Roman period: "While there was fairly extensive cultivation on the chalk and also on the loam soils of the southeast, most of the English lowlands, for example the Weald and the English Plain, were covered with oak forest, mainly uninhabited and harbouring . . . wolf, lynx and bear, besides numerous deer." In Bradgate Park in Leicestershire there is down by the stream a piece of landscape against a background of oak, bracken and stag which must resemble very closely what the lowlands of the Midlands looked like in Roman times.

The Normans contributed numerous castles to the partly erased features of our palimpsest. The one at Carew guarded the tidal ford over the eastern arm of Milford Haven and the great castle of Pembroke on the south shore of the haven formed part of a system to protect the English settlers in the low grounds from the Welsh in the hills to the north. The castle on the rock of Stirling defended the lowest bridge over the Forth leading into the heart of the Highlands.

The ridge and furrow pattern of the fields, well developed on the clay grasslands of central England, records the strip system of arable farming practised in medieval times. In some areas it has been obliterated by the conversion of grassland to arable during the two wars.

Many other examples of landscape features of the past still present in the landscape of to-day could be given but we must now glance briefly at some changes in the landscape due to the growth of human knowledge and science in its various aspects. The building of canals greatly facilitated the movement of goods before the coming of the railways. Advances in road construction led to the large-scale working of stone and the igneous rock quarries of Leicestershire and other areas became striking, if at times objectionable, features of the landscape. This is also true of the open-cast working of iron ore and the erection of blast furnaces on or near the new ore fields as at Corby and Asfordby. Large-scale production of steel made possible the erection of large steel bridges where stone was unsuitable, for example the Clifton Bridge over the Avon near Bristol and the Connell Bridge over the narrows of Loch Etive on the west coast of Scotland. This latter bridge, well known to motorists, saves a journey by road of some 60 to 70 miles. To satisfy the growing industrial and domestic demand for water the natural features of the mountain areas of Scotland, the Lake District, Wales and the Pennines have made it possible for engineers to construct dams and reservoirs as in the Derwent valley at Lady Bower—the dam and reservoir both producing radical changes in the landscape.

The use of water to generate electricity has added to the landscape in addition to the dam and reservoir a power station usually at a lower level and the penstocks to carry the water down to give the necessary head, as in the case of the Loch Sloy station on Loch Lomond side. Further, the distribution of the electric current has led to the erection of the pylons of the grid as seen to-day in Glen Falloch and other Highland glens.

The growth of sea transport, while it has not changed the surface of the sea has produced striking changes on land. Among them are the numerous lifeboat stations round our coasts as at Whitby. On the northeast Yorkshire coast there are twelve lifeboat stations in a distance of about 60 miles from Teesmouth to Bridlington. The coast, bulging out to sea, is armed with numerous reefs like teeth where the more resistant members of the rock formations strike the shore at right angles. These reefs constitute a serious danger to the heavy traffic up and down the coast which for reasons of economy hugs the coast as closely as possible. The danger is at its maximum in times of fog or northeasterly gales.

Lastly the invention of the combine which cuts, threshes and bags grain in one operation in the field is producing radical changes in the landscape of arable farming. The small fields of the past with their bounding hedges are disappearing, to be replaced by much larger fields

of 100 acres or more and in some parts the essential character of the English countryside is changing out of all recognition.

Usually, as we have seen, the landscape is changed as a result of human interest in it but this is not necessarily so if we consider the influence of landscape on human thought and literature. Dr. Vaughan Cornish wrote a book on the *Poetic Impression of Natural Scenery* and many writers and poets have been influenced by certain aspects of scenery.

Wordsworth after visiting the desolate Kirkstone Pass in the Lakes was inspired to write

"Who comes not hither ne'er shall know
How beautiful the world below."

and of the quiet surface of Grasmere towards evening he wrote

"Clouds lingering yet extend in solid bars
Through the grey west; and low these waters, steeled
By breezeless air to smoothest polish, yield
A vivid repetition of the stars."

and went on

"At happy distance from earth's groaning field.
Where ruthless mortals wage incessant wars,"

and later

"But list a voice is near;
Great Pan himself low whispering through the reeds,
Be thankful, thou; for if unholy deeds
Ravage the world, tranquillity is here."

Of tiny Rydal Mere someone has said

"A spoonful of blue in a cup of green hill"

It could have been the water and reeds at the edge of this mere that inspired Tennyson to write

"I heard the ripple rustle in the reeds
And the wild waters lapping on the crag."

One cannot say that in any of these cases there has been any change in the landscape but there has been an influence exerted on human thought; in some cases it has been stimulated; in others depressed. It is not surprising then that beauty spots like Snowdonia, or what is perhaps one of England's greatest beauty spots—Dovedale—have inspired men to agitate for the setting aside of parts of the country as National Parks.

Now if I may briefly summarize. All down through human history man has been at work changing the landscape. Some of these changes we have seen and we have noted the great influence of the physical setting on them. These changes taking place in differing physical settings give rise to differing relationships and responses, to differing cultural or man-made landscapes, and therefore to regions, sub-regions or areas. We thus find in each area or region, or sub-region, a grouping and repetition of landscape phenomena both physical and cultural.



Plate I.—Caisteal Abhail Corrie, North Arran.



Plate II.—Cromlech Arthur, St. David's Head, Pembroke.



Plate III.—Fenland farm. Potato clamp and drain near Guyhirne; main road on right slightly raised.

Plate IV.—Ladybower dam and reservoir on river Derwent, Derbyshire.



This grouping and repetition of landscape phenomena to me is the hall-mark of the region—each region, sub-region or area being differentiated from its neighbour by a change in the characteristic grouping of the forms and features of the landscape. Applying this test to the area of Leicestershire it is possible to divide the county into ten clear-cut sub-regions.

The study of landscape in this way is an exacting study. It involves observing and recording the facts of both the physical background and the cultural landscape. It involves further the interpretation of the relationship between the two. Since the relationship itself is recorded in the cultural landscape, this landscape is the starting point for our investigation.

In conclusion may I say that I personally feel convinced that the study of this relationship as expressed in the cultural landscape is the central core of geography. At times there may be a tendency to run too much to one side or the other, i.e., to the study of the purely physical on the one hand or to the overemphasis of the purely human or economic side on the other. Either of these errors could lead to the loss of that wholeness of the geographical outlook which binds the different parts of the subject together, and gives it a distinctiveness, a significance, and a unity which it would otherwise lack. This wholeness, this centrality of outlook, is to me geography.

Morphological Mapping

R. S. WATERS

MEMBERS OF THE ASSOCIATION who attended its Exeter Summer School held in 1955 will remember the interest that was there shown in the methods of land-form mapping that were demonstrated by Mr. R. A. G. Savigear and Mr. R. S. Waters. When at the Sheffield meeting of the British Association for the Advancement of Science in 1956 Mr. Savigear and Mr. Waters conducted an excursion of Section E to the moors and cloughs west of the city to demonstrate these methods on the ground where they had been evolved the interest greatly enlarged. Indeed there has since been a steady trickle of correspondence asking whether other workers could apply the techniques involved to other areas and if so whether any printed account existed to guide their endeavours. The fact is that the answer to the first of these two questions is a very definite "yes", but till now the second has unfortunately been "no". In the article that follows Mr. Waters has made good this deficiency, and workers all over the country may now attempt land-form mapping of this kind. There are, however, two matters on which something should be added to Mr. Waters' article. The first concerns the growth of the project to its present form: the second concerns its future potentialities.

Land-form mapping on the six-inch scale was introduced as a class exercise for students of Sheffield University by Mr. I. S. Maxwell, Mr. R. A. G. Savigear and myself as long ago as 1948. It was, however, interpretative mapping involving the recognition of a particular land form on the ground and its representation by symbol on the map: the classification set out on pages 16 and 17 is in essence that which we drew up at that time. Experience, however, showed that interpretative mapping was too difficult; the same ground would be differently classified by different students. Something more objective was required and gradually the scheme here outlined was developed. That development was essentially collaborative and in addition to those already named I should mention and thank Mr. R. H. Johnson of the University of Manchester and Mr. A. Straw and Mr. A. Young of the present staff of the Sheffield Geography Department.

The future potentialities of this method are very large. Since it is empirical and not interpretative it does not need to be carried out by experts. Any observers who are interested in and sensitive to the form of the ground and prepared to be patient and scientifically honest in recording what they see, can carry it out. Just as the Land Utilisation Survey of Great Britain, indissolubly linked with the name of Professor Dudley Stamp, was carried out by voluntary workers who offered their

► Mr. Waters is a lecturer in geography at the University of Exeter.

services in all parts of the country, so the possibility exists that such volunteers could contribute a sheet to a Land Form Survey of our country. The Land Utilisation Survey of 1931-36 has become a basic document for the historical geography of Britain in the twentieth century and must still be taken into account in all our ventures in land planning. A Land Form Survey would, perhaps more than the maps of the Geological Survey, become a basic document throwing light on the maps produced by the Soil Survey, and one essential to the interpretation of past and present land use and any consideration of land-use planning. If there are members of this Association who wish to undertake morphological mapping which might be part of a co-ordinated Land Form Survey, will they please write to me, at Geographical Association headquarters, enclosing a stamped envelope for reply? When it is clear that something useful can be attempted a programme will be drawn up.

DAVID L. LINTON.



THE CONFIGURATION OF THE LAND SURFACE is widely acknowledged to be the most fundamental element in the geography of an area. In any regional study whether on a continental or a county scale, its description takes pride of place among the region's intrinsic characteristics and its portrayal is essayed on a map of appropriate scale. For such studies the advantages of a representation of the relief by means of contours taken from the relevant topographic sheets are universally appreciated; within the limits imposed by the scale of the map and the contour interval there exists no other quantitative expression of surface configuration that is either so accurate or so comprehensible. Even so, there are occasions when the need is manifest for a map which portrays in greater detail the "shape of the ground."¹ Can it be denied that the relations between land use and physique which are considered in the county reports of the Land Utilisation Survey would be more readily perceived and understood if morphological maps had been available for inclusion alongside those showing relief and geology? But what is perhaps merely desirable in an account of the geography of an area of the size of a county, wherein the most obvious and significant variations in the landscape are seen to be related to lithological differences, becomes indispensable when the unit of study is reduced to a *tract*, that is, the environmental unit developed on one geological formation.² Then it is that the landscape patterns demand for their proper understanding an appreciation of surface configuration on a scale all too rarely attempted hitherto, an appreciation in which the space relations of each individual *facet* of the land surface are considered, namely, its degree of slope and its aspect. This information can only be obtained, at present, by field survey, because the increase in the scale of the topographic maps available and appropriate for the more detailed study is not accompanied by a commensurate decrease in the vertical interval between their surveyed contours.

A morphological map is basically the cartographic expression of the distribution pattern of such facets of the land surface. On it are defined the boundaries of the morphologically indivisible units, slopes and flats, of which all landscapes are composed. By means of a few variously decorated solid and broken lines the nature of the junction between adjacent units can be indicated and certain characteristics of the facets themselves may also be shown by symbols, shading or stippling.

Defined thus, the morphological map is no innovation. It has long been made and used by geographers investigating research problems in the different systematic branches of the subject; and for geomorphologists the completion of a map of surface forms is an essential pre-requisite to any objective consideration of the morphological evolution of a landscape. Nevertheless, few large-scale morphological maps have been published, although small-scale reductions showing the distribution and mutual relations of certain *selected* facets appear as necessary accompaniments of most papers in the field of denudation chronology. With the characteristics and merits of these latter distribution maps we are not here concerned; their value and limitations in regional geography have recently been considered by Mr. C. E. Everard.³ Rather do we wish to illustrate the objects and methods of morphological mapping by referring to the various attempts which have been made at the University of Sheffield to map and classify *every* surface facet in an area.

THE FIELD SURVEY

Instruction in the field technique of morphological mapping was begun in the Geography Department in 1948. By virtue of its exacting demands on the student for careful and purposeful observation and clear and accurate delineation on a base-map of morphologically indivisible units of the land surface, its value as a training method in field work was quickly appreciated, and for the past six years each honours student has been required to map the morphology of three square miles of country in the Southern Pennines. But apart altogether from its potentialities as a practical exercise suited to a university discipline the closely supervised field survey has, of course, provided us with a map of surface forms unique alike in its detail and the extent of its cover. Map A (see folder at the end of this article) is a sample of the complete map which to date depicts the surface configuration of 100 square miles of the Pennine landscape.

The equipment that is normally required by the morphological surveyor includes only those items which are commonly used in geographical field work:—a base-map (a sheet, or portion thereof, of the O.S. 6 inch to the mile map); a mapping board and waterproof cover; spring clips or elastic loops for securing the map to the board; a clinometer for measuring slope angles and, if required, dips of strata; a 12-inch ruler; a field note-book, and of course, a supply of well-sharpened H pencils and an eraser. In addition to its many obvious

uses the ruler may also be employed as a sight-rule in position fixing, though on open moorland or similar terrains where map reference points are few and widely scattered a prismatic compass is indispensable for this purpose.

On the Southern Pennines 1 : 10,560 has been found to be the most suitable scale for the base-map. 1 : 25,000 is too small and the advantages to be gained by using the 25-inch map in highly accidented areas were deemed to be far outweighed by (1) the small area of ground covered by field-slips taken from it, and (2) the very great reduction which would be involved in the production from the field sheets of a publishable map on a convenient scale (1 : 25,000).

A purely empirical morphological survey involves the identification and mapping of each surface facet and the determination of its slope and aspect. All other considerations are secondary, though additional information such as the structural relations of the facet, its relation to local base-level or its constitution (rock-cut or alluvial, etc.) may be required if the mapped unit is to be assigned a place in a genetic classification. The first objective is attained by plotting the *morphological discontinuities* which bound the facet. The discontinuity is either a sharp *break* of slope, i.e., it is visibly angular (though the angular difference between the slope of adjacent facets may be small), in which case it is represented by a continuous line whose position is immediately obvious; or it is a smooth *inflexion* of slope, comprising a curved segment of variable length and possibly of varying radius; it is then shown by means of a broken line bisecting the linear zone over which the discontinuity extends. The degree of (steepest) slope of the mapped facet is then measured with a clinometer and, if space permits, is recorded directly on the base-map together with an arrow indicating its direction. The size of the smallest facet which can be plotted to scale is obviously dictated by the scale of the base-map: on a 6-inch map it is impossible to record a feature with dimensions of less than c. 15 by 15 yards. The morphological characteristics of such a feature would normally be the subject of an entry in the field note-book which is also used for recording all information additional to that required by the empirical survey.

The Completed Map

Map A is an example of one of several ways in which the information recorded on the field sheets and in the note-books may be represented in a readily comprehensible manner on a publishable map. It displays, for the area of four square kilometres that is represented by the extract from the O.S. six-inch sheet (Map B), the land surface divided into its constituent morphological elements, each of which is bounded by breaks or inflexions. But it will be observed that the degree of slope of each unit is omitted; consequently, an indication is necessary as to whether its bounding discontinuity is convex- or concave-upwards. Hence the

continuous or broken line is qualified by the addition of an arrowhead, or V, which *always points downhill*, and is always placed on the *more steeply sloping side* of the line. Since the symbol always stands on the steeper slope, and because "flats" are relative things, a "flat" is always free from symbols. It is essential that the arrowheads be kept as small as possible so that we may still portray small facets in highly accidented country, or the larger but highly inclined facets in areas characterized by steep slopes. Even if we keep the combined breadth of the line and its attached arrowheads down to a twentieth of an inch, as is done in Map A, it must be remembered that at our mapping scale ($1/10,560$) this represents about 15 yards and we may encounter situations where the horizontal equivalent of a facet is less than this. If the small facet is in the nature of a flat, e.g., a marked ledge on a steep slope, the symbols we have already defined will serve. But if the small facet is a steeper slope with a convex break or inflexion above and a concave break or inflexion close below, there will not be room to draw the appropriately placed arrowheads: a third basic symbol is therefore used for such cases.

Although for the sake of clarity individual slope angles are not shown in the scheme employed for Map A three categories of facets are there distinguished on a basis of surface inclination. Close stippling and light stippling are used to distinguish cliffs and slopes steeper than 40° down to 5° , while slopes less than 5° carry no stippling at all. In the field it will be convenient to use two coloured pencils to record this slope classification.

This completes the basic symbols used in the present scheme, namely three types of break (convex, concave and convex with a concave break or inflexion immediately below), the three corresponding types of inflexion, and three categories of slope. These have been found sufficient for the landscapes of the Pennines and Lincolnshire. Diagram C (beside Map A) shows an imaginary relief profile in which most of the commonly occurring combinations of breaks, inflexions and slopes have been introduced. Their symbolic map representation is indicated in the adjoining column, which, with the accompanying verbal descriptions, may serve as an extended key to all morphological maps drawn to this scheme.

Comparison of Map A with Map B will reveal how much the morphological map shows of which there is no hint on the contour map. On the other hand the altitudinal relations of the facets shown on Map A either to sea-level, local base-level or to each other can only be elucidated with the aid of the contour map. Similarly Map A of itself gives no hint of the relations of the facets shown to geological structure, but some interesting points will at once emerge if Map A is compared with the relevant portion of the geological map ($1/63,360$, sheet 100, Sheffield, 1956). Indeed it is only by detailed analytical studies of the information provided by all three maps, morphological,

topographic and geological, that we may proceed to allot to our empirically defined facets a place in a genetic classification and embody them in the corpus of geographical facts upon which any explanatory description of the landscape of an area must be based.

DISCUSSION

The undoubted merits of this empirical scheme of morphological mapping all derive from its simplicity. Its sole demand of the field worker is an innate or acquired aptitude for careful observation and accurate plotting. Consequently it is possible for anyone who can read a base-map to make a morphological map. Moreover, this system of survey and mapping which has been used to record every mappable detail of the surface configuration of Pennine landscapes is, like contouring, capable of universal application. All natural landscapes, whatever their origin, are compounded of facets whose boundaries, inclinations and aspects may be recorded on the morphological map.

The chief defects of the existing scheme arise from the fact that certain fundamental characteristics of the mapped units are inadequately expressed on the completed map. For instance, the facets shown on figure 1 are grouped, according to their surface inclinations, into three categories only and there is no accurate indication of their aspects, i.e., the directions in which they have their steepest slope. This threefold grouping of slopes was largely dictated by the fact that the distinction of a larger number of slope categories would impair the clarity of the finished map upon which all the morphological characteristics of the terrain were to appear in black and white. Choice of the thresholds of 5° and 40° was not entirely arbitrary. A facet with a surface slope of less than *c.* 5° is either a flat or a gentle slope—erosional and/or constructional—developed very near to an existing or former base-level and the processes which originally fashioned and continually modify it would appear to differ from those in operation on steeper slopes. The 40° threshold, likewise, not only separates slopes (moderate, fairly steep and steep) and very steep slopes;⁴ it divides bare rock or discontinuously debris- and vegetation-covered slopes from cut and built surfaces with a continuous soil cover which are subjected to distinctly different processes of sub-aerial modification.

With regard to the representation of the aspect of individual facets Map A is admittedly inadequate. In an alternative scheme the direction of slope of the mapped units could be indicated if the symbols attached to the lines marking breaks or inflexions were given a directional quality, i.e., if instead of being conventionally drawn normal to those lines they were so orientated as to point always down the steepest slope. Alternatively, both slope and aspect might have been represented by hachures: surface inclination of the facet being given by the density of these elongated wedge-shaped symbols and its aspect by their

orientation. However, this method of representation has not been adopted because it results in a map so thickly covered with lines that there is little space available for the expression of additional information. And it is desirable that the map should be so constructed that symbols and/or identification letters can be added to the facets if, and when, these units are subsequently given a place in a genetic classification. Moreover, although the map has great intrinsic value as a unique expression of the detailed configuration of the land surface its valuable role in geographical studies will be the more readily perceived if it is sufficiently clear to be used as a base-map upon which other natural or cultural features can be plotted.

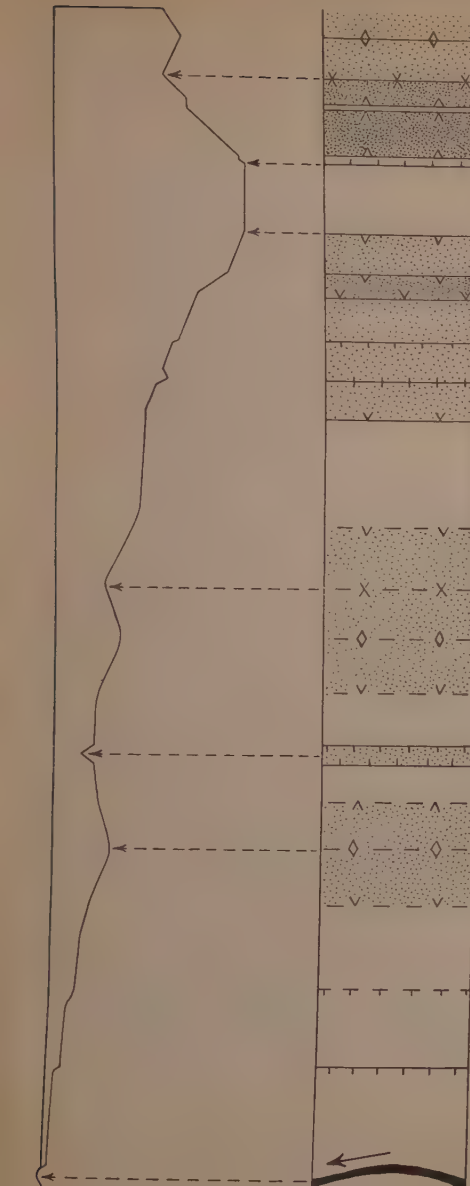
The successful application of the empirical scheme of morphological mapping described above presupposes no prior knowledge of geology or geomorphology on the part of the field surveyor, and it leaves little room for subjective interpretation. Consequently it may be recommended as an elementary training method in our field science. It would seem to be eminently suitable as a field exercise for sixth-form pupils or first-year college and university students. But it cannot be emphasized too strongly that for more advanced students the construction of a morphological map is only the essential first stage in their study of a landscape. Recognition and delineation of slopes and flats must be followed by their analysis and classification; the empirically defined units of surface must be assigned a place in the genetic classification of land forms. The nature of each land form may then be indicated on the morphological map by means of a letter or symbol.

The following classification is one of several which have been used for the land forms of the unglaciated upland terrain of the Southern Pennines; it would obviously require considerable elaboration before it could be applied to the facets of landscapes with a different type of morphological history.

I Flats near local base-level or the water table

Flood plain of silt, inundated by ordinary floods	..	FP
(on the morphological map)		
„ „ „ „ inundated by extraordinary floods	..	EFP
„ „ „ gravel (Bar plain)	.. ..	BP
Natural levee	.. ..	L
Mortlake	.. ..	M
Filled channel or backwater (swale)	.. ..	S
Meander terrace	.. ..	MT
Lake or pond	.. ..	W
Filled lake or pond	.. ..	V
Undrained swamp	.. ..	U
Drained „	.. ..	D
Spring-sapped recess	.. ..	R

C Specimen map-strip showing use of basic symbols in combination



- Convex break between opposed slopes (=angular crest).
- Concave break between opposed slopes (=angular talweg).
- Concave break with convex break immediately below (=midslope ledge).
- Convex, concave, and convex break defining ledge at top of slope.
- Convex break.
- Convex break (at top of steep slope).
- Concave break (at foot of steep slope).
- Convex break with concave break or inflexion immediately below.
- Convex break between opposed slopes, each with concave break immediately below (e.g., landslip hummock).
- Concave break.
- Convex inflexion.
- Concave inflexion between opposed slopes (=rounded talweg).
- Convex inflexion between opposed slopes (=rounded crest).
- Concave inflexion.
- Convex breaks with common concave break immediately below (= gully).
- Concave inflexion.
- Convex inflexion between opposed slopes (=rounded crest).
- Concave inflexion.
- Convex inflexion with concave break or inflexion immediately below.
- Convex break with concave break or inflexion immediately below.

River.

Feet

5000

4000

3000

2000

1000

0

500

1000



Breaks

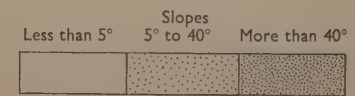
Convex

Concave

Convex with concave immediately below

Inflexions

Basic symbols



Morphological map based on O.S. map and Six-inch map reproduced with the sanction of the Controller of H.M. Stationary Office.

Printed by John Wright & Sons Ltd., The Stonebridge Press, Bristol.

II *Flats significantly higher than local base-level or the water table*

River terrace	..	..	..	..	..	T
Spur flat or hill-top flat	..	..	..	..	..	F
Peat forming	..	..	..	..	..	$\bar{P}$
Peat eroding	..	..	..	..	..	$\underline{P}$

III *Constructional slopes*

Alluvial fan or cone	..	..	..	..	Δ
(a) of sand and finer gravel	..	..	..	..	Δ
(b) of coarse gravel and boulders	..	..	..	..	Δ
Scree fan or talus apron	..	..	..	..	Δ
Boulder-strewn ground	..	..	..	..	$\circ \circ \circ \circ$
Block-strewn ground	..	..	..	..	$\Delta \Delta \Delta \Delta$
Landslip hummocks	..	..	..	..	$\cup \cup$

IV *Significant erosional slopes*

Actively undercut river bluff	..	..	..	..	Br
Abandoned	..	..	..	..	Ba
Escarpment	..	..	..	..	Et
Rock cliff	..	..	..	..	Cr
Landslip scar	..	..	..	..	Ls
Stripped stratum plane (dip-slope)	..	..	..	..	Ds

This classification, initially devised for the facets of the Southern Pennines, has proved sufficiently comprehensive for the land forms of widely separated portions of the English Plain. It has been used on morphological maps of parts of Devonshire, Wiltshire and Lincolnshire and there is good reason to believe that it will prove to be as well suited to the forms of other lowland areas in Britain. But for the land forms of formerly glaciated upland areas it will require elaboration and it is appropriate that workers with field experience in these areas should devise the necessary amendments and additions.

The initial empirical scheme of survey and mapping may, however, be applied anywhere and it is hoped that this account of the simple techniques that are involved in its application will encourage all who are interested in the "shape of the ground" to map the morphology of the local area as a first step towards a fuller understanding of its geography. Each completed morphological map is an addition to recorded knowledge; it may also be the point of embarkation for further voyages of geographical discovery.

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An Excursion to the Central Weald

H. C. K. HENDERSON AND E. C. F. BIRD

DURING THE GEOGRAPHICAL ASSOCIATION SPRING CONFERENCE at Brighton in 1956 the authors led an excursion into the Central Weald. It is thought that a description of the route then followed, which totalled some eighty-five miles, might be of interest and value to other members of the Association who may have opportunities of exploring the Central Weald for themselves. The relevant maps are the Ordnance Survey one-inch sheets 171 (London S.E.), 182 (Brighton and Worthing) and 183 (Eastbourne), and Geological Survey maps (Old Series) 5, 6, 8, and 9 and (New Series) sheets 318 (Brighton) and 319 (Lewes). For a general account of the Wealden district the reader is referred to the New Naturalist volume *The Weald* by S. W. Wooldridge and F. Goldring¹; for a geological description to the British Regional Geology publication *The Wealden District* by F. H. Edmunds²; and for a discussion of the geomorphology to *Structure, Surface and Drainage in South-East England* by S. W. Wooldridge and D. L. Linton.³ Reference should also be made to the Land Utilisation Survey Report on Sussex by H. C. K. Henderson and E. W. H. Briault.⁴

The South Downs and the Low Weald of Sussex

From Brighton, the ascent to Devil's Dyke is made by way of Dyke Road and Red Hill (285081*). There are excellent views of the open chalkland of the South Downs dip-slope and of the urbanized Sussex coastal plain, which widens westwards. B. W. Sparks⁵ has described fragments of erosion surfaces cut at various levels on this chalk dip-slope, and above Red Hill the road crosses one of these remnants (430 feet), and climbs to another (475 feet). Further fragments are seen on adjacent ridges. Sparks' conclusion that these are remnants of platforms of marine erosion marking stillstands during a period of intermittent relative lowering of sea level is one which illuminates the study of other parts of the Wealden district. Another feature of geomorphological interest is the system of deep, well-rounded dry valleys incised into this dip-slope. These must indicate a former period of stream dissection, but the manner of their origin has been a matter of controversy: some, following Clement Reid, have explained them as the work of melt-water on frozen (and therefore impermeable) chalk during the cold phases of the Pleistocene period, while others, notably C. C. Fagg, have seen them as the work of normal stream erosion before recession of the Chalk scarp, and the consequent lowering of

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* Numerals given in brackets are National Grid references.

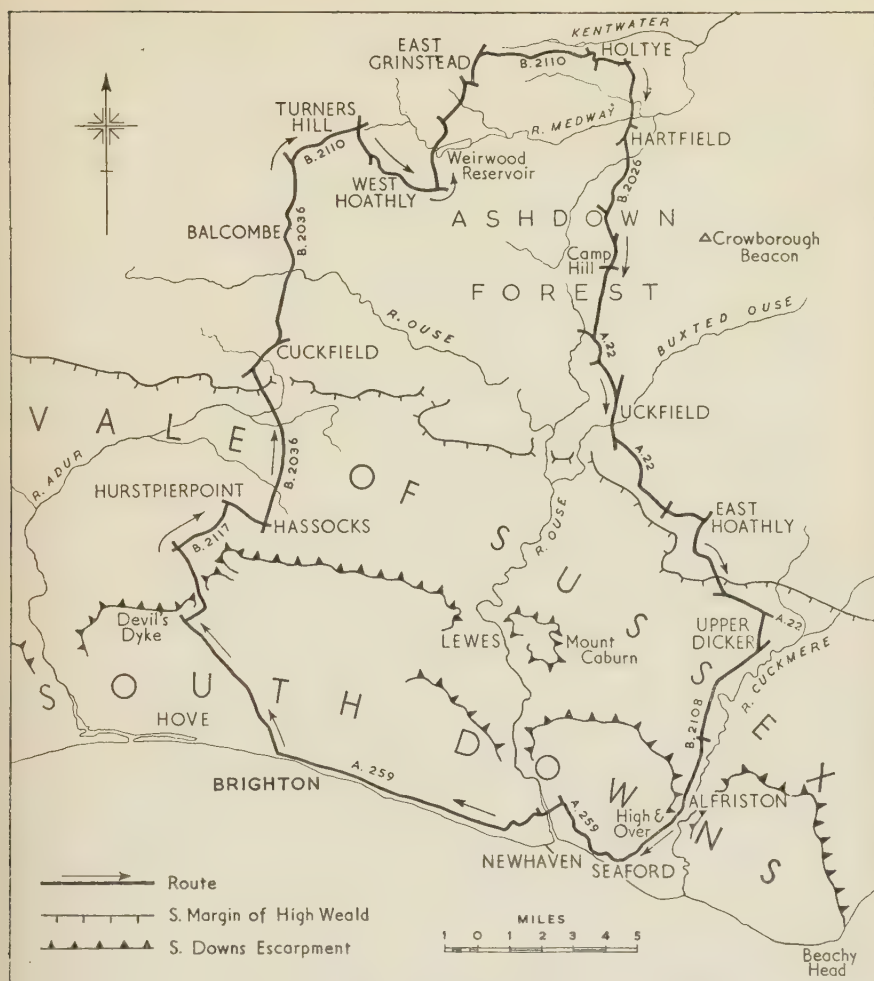


Fig. 1.—Route Map

the Chalk water-table, left them dry. Some of these valleys follow sharply winding courses, a feature well illustrated in the Waterhall valley east of the road. Sparks has related some of these changes of valley direction to the emerging shorelines of earlier stages, and they may possibly represent partial adjustment to outcrops of less resistant bands in the Chalk.

The soils of the dip-slope are generally shallow and chalky, particularly on the slopes of the dry valleys. The steeper slopes are under permanent grassland, the gentler slopes and "flats" largely under arable farming; the landscape is open and tree-less. Towards the crest of the South Downs there is a capping of superficial Clay-with-Flints, forming more acid, stony clay soils which bear rough pasture and patches of scrub.

From the crest of the Chalk escarpment at Devil's Dyke, in front of the hotel (258112) there is an extensive view across the Low Weald of Sussex to the wooded ridges of the interior hill-country, the High Weald, and on a clear day the northern Lower Greensand escarpment at Leith Hill and the Chalk escarpment near Dorking may also be seen. Westwards, the impressive South Downs escarpment continues beyond the Adur gap to the promontory above Washington, where it is crowned by the beech trees of Chanctonbury Ring (139121). A little to the south, Cissbury Ring (141082) stands out on a fragment of the secondary escarpment formed by a resistant band in the Upper Chalk, the *Actinocamax quadratus* zone.

The immediate foreground is best considered with the geological map (Sheet 318, Brighton) in hand. A narrow outcrop of Upper Greensand emerges at the base of the Lower Chalk to form a bench in the scarp-foot zone on which are sited the villages of Poynings, Fulking and Edburton. Soils derived from the Lower Chalk and Upper Greensand with a superficial layer of chalky down-wash are rich loams, and arable farming has persisted in this scarp-foot zone during all the vicissitudes of agricultural economics in the past century. Beyond is the outcrop of the Gault, which produces heavy clay soils, largely under oak-hazel "coppice-with-standards" woodland and permanent grass. Next comes the low ridge of the Folkestone Sands, and thus far the landscape presents the sequence of land types and settlement pattern characteristic of the Wealden margin. There are, however, complications due to minor structures. The Pyecombe anticline (strictly speaking a pericline, or elongated dome) runs from west to east in the foreground and is succeeded northwards by the parallel Henfield syncline (Fig. 2). The Chalk escarpment swings northwards at Poynings across the eastern end of the pericline to the promontory of Wolstonbury Hill (284139) on the northern flank of the Henfield syncline. The ridge of the Folkestone Sands curves similarly across the eastern end of the pericline and out across the syncline to Henfield, before returning eastwards parallel to the Chalk escarpment. The intervening Gault follows a similar pattern and the usual sequence of outcrops is resumed below Wolstonbury Hill. In this portion of the Weald both the Folkestone Sands and the Hythe Beds are more calcareous than in the west and their soils are traditionally utilized for arable cultivation.

Behind the Dyke Hotel (260110) the deep V-shaped dry valley of Devil's Dyke may be seen descending and curving sharply northwards to emerge from the Downs at Poynings. This steep-sided valley is clearly contrasted with the broader, more rounded valleys of the dip-slope. A bench on its southern side at about 400 feet (267114), well seen from the road as the descent is made to the Saddlescombe col, may be a remnant of the valley floor at an earlier stage when the Dyke was a tributary of the Saddlescombe-Waterhall valley system. Northward diversion and deepening has followed recession of the escarpment at Poynings, where

Adur tributaries have cut back along the Pyecombe anticline. The present form of the valley may be due either to spring-head erosion (which still proceeds, in the bottom of the valley at the present level of the water-table, 265115) or to erosion by melt-water under cold climatic conditions during the Pleistocene period, which the authors consider less likely.

As the descent is made to join A.281, there are fine views, firstly, above Saddlescombe, of an excellent coombe, the floor of which has been cultivated continuously for over a century, and secondly along the escarpment (Plate 4 in *The Weald*). Typical Gault country is traversed to Shaves Wood, and along B.2117 to Middleswood and Hurstpierpoint, where the three divisions of the Lower Greensand are crossed in succession: the low Folkestone Sands ridge, the hollow of the loamy Sandgate Beds, and the second low ridge of the Hythe Beds. There is no bold Lower Greensand escarpment here comparable with that of the western Weald; the three divisions are thinner than their western counterparts, and there are no resistant chert beds. Instead, these low ridges form a "dry zone" with arable land between the pastoral land of the Gault and Weald Clay outcrops, and provide sites for settlements such as Hurstpierpoint and Keymer, with large parishes extending into the bordering clay-lands.

The lithology of the Folkestone Sands is well displayed in Hassocks sand-pit (294155) where red sands are capped by the green material of the basal Gault. This sand-pit is excavated in part of the "200-foot platform" described by Kirkaldy and Bull⁶ in the southern Weald, and the superficial drift contains frost-chipped flints, and shows contortions indicative of cold climatic conditions. This drift material must have been transported across the 200-foot platform from the Chalk escarpment during a cold, "periglacial" phase after the formation of the platform on which it now rests. The quarry also shows a section through a minor Roman Way, running from west to east, underlain by sands leached by percolating water.

Northwards from Hassocks cross-roads B.2036 soon enters Weald Clay terrain. As may be seen, this is not strictly speaking a "plain" but an undulating lowland, dissected by Adur headstreams. Sandstone bands in this thick clay formation form small-scale scarps, one of which, described by the Rev. J. W. Reeves,⁷ is seen east of the road (313207). This pastoral landscape is being invaded by residential settlements such as Burgess Hill, spreading round stations on the London-to-Brighton railway, and housing London workers.

The High Weald

A mile south of Ansty, the road passes from Weald Clay on to Hastings Beds and climbs the first of the ridges of the High Weald. The Weald Clay consists largely of soft clay with occasional bands of sandstone; the underlying Hastings Beds consist of sandstones with subordinate clay formations and are subdivided thus:

Upper Tunbridge Wells Sand (with Cuckfield Clay near Cuckfield).
Grinstead Clay.

Lower Tunbridge Wells Sand (with massive Sand Rock around East
Grinstead and Tunbridge Wells).

Wadhurst Clay (with clay-ironstones near base).

Ashdown Sand.

The Hastings Beds show clearly the subsidiary folding and faulting, mainly along west-east lines, characteristic of the Wealden anticlinorium. These folds were described in Topley's famous memoir on the Geology of the Weald⁸ and some of them, in greater detail, in connection with the search for oil in Sussex, by the Rev. J. W. Reeves.⁹ The landscape of the High Weald consists of ridge crests, small plateaux, valley benches, steep valley sides and valley floors winding, branching, ascending and narrowing upstream into the deep, V-shaped "ghylls" in the head-water regions. In the Land Utilisation Survey Report on Sussex,⁴ a subdivision of the High Weald into relief types was attempted on the basis of Plateau tops, Zone of marked relief, and Zone of wider, steep-sided valleys, and the map (Fig. 3 in the Report) is worthy of study. Detailed field studies of the intricate pattern of landforms in this region have yielded evidence of close relationships between structure, lithology, drainage pattern, and surface features, within limits set by a history of alternating rejuvenation and stillstand comparable with that deduced by Sparks⁵ from the South Downs dip-slope. The Hastings Beds structures have been exhumed from a thick Weald Clay cover and deeply denuded by the headstreams of the Wealden rivers. Each of the subsidiary formations of the Hastings Beds has been exposed as the result of this denudation, and further east the underlying Jurassic rocks are seen. Many of the headstreams have become aligned with synclines or faults, or simply with the geological strike, and the drainage pattern generally shows a degree of adjustment to structure which must indicate long-continued subaerial denudation. This process has been influenced by the resistance of the rock formations encountered and by the limits set to downward denudation by past and present regional base-levels. Many of the small plateaux and valley benches are true erosion surfaces, fragments of earlier valley floors, and the High Weald may be described as a landscape of dissected partial peneplains. Examples of these features are seen in the course of the traverse now described.

From Ansty, the road to Cuckfield (A.272) climbs on to the crest of a ridge concordant with the west-to-east Cuckfield anticline (Fig. 2). The Upper Tunbridge Wells Sand has been partly denuded on the flanks of this ridge to expose a subordinate clay formation, the Cuckfield Clay. Cuckfield is the first example on our route of a ridge-crest settlement, a characteristic settlement type in the High Weald. Northwards, B.2036 descends into the valley of the Ouse which here follows

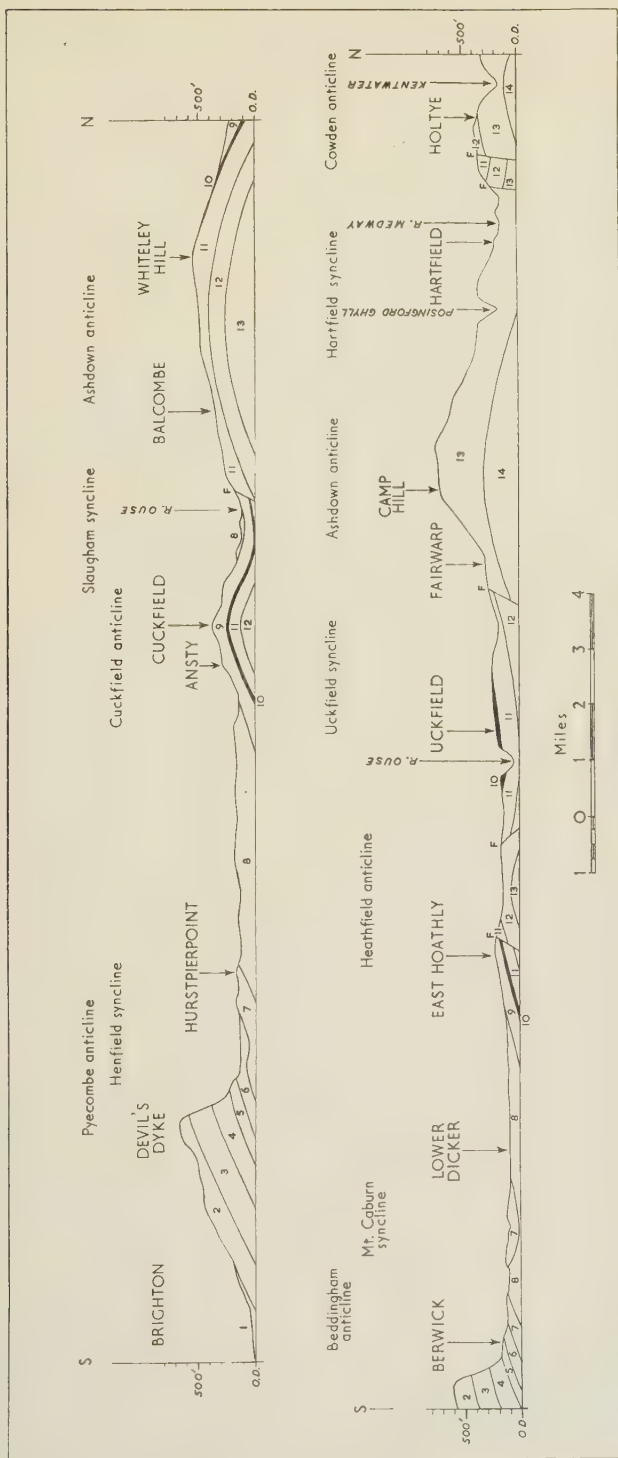


Fig. 2.—Sketch sections (much generalized) to show geology along parts of the route.

1. Reading Beds and Coombe Rock. 2. Upper Chalk. 3. Middle Chalk. 4. Lower Chalk. 5. Upper Greensand. 6. Gault. 7. Lower Greensand. 8. Weald Clay. 9. Upper Tunbridge Wells Sand. 10. Grinstead Clay. 11. Lower Tunbridge Wells Sand. 12. Wadhurst Clay. 13. Ashdown Sand. 14. Jurassic. F. Faults.

the line of the Slaugham syncline on a long narrow outlier of Weald Clay. Valley benches at about 250 feet near Brook Street probably represent an extension of the 200-foot platform at an ascending level into the upper part of the Ouse valley.⁶ Lower terraces border the narrow valley floor of the Ouse, beyond which the road climbs a tributary ghyll to Balcombe station. Here the upper part of the Lower Tunbridge Wells Sand is a massive Sand Rock which outcrops as bare rock masses on the valley sides, a characteristic feature in the High Weald. The axis of the central and most elevated anticline, the Ashdown anticline, pitching westwards, is crossed near Balcombe station. Above Monks (309330) a valley side faces eastwards up the rising anticlinal axis and shows a moderate slope on Upper Tunbridge Wells Sand and Grinstead Clay and a deeply-incised ghyll in massive Lower Tunbridge Wells Sand. Soils derived from the Tunbridge Wells Sand in this part of the High Weald are dry and acid, and a glance at the Ordnance Map shows that they are largely under heath and woodland, particularly on the steeper valley sides. The woodlands are derived from the original forest cover of Andreadsweald and are now either semi-natural "high forest" of oak, beech, sub-spontaneous pine and various exotic trees planted on large estates or "coppice-with-standards", often in poor condition, consisting of oak standard trees and a coppiced shrub layer of hazel or chestnut. When properly managed, "coppice-with-standards" yields regular crops of large oak timber and, more frequently, small wood for poles and fencing. The farmed lands in this region are essentially clearings in the forest; farm economies are based on dairying and the land is under permanent grass or roots and other fodder crops.

From Whiteley Hill, the road to Turners Hill (B.2110) follows the water-parting between the Ouse and the Mole drainage systems. There are good views southwards across the Ouse basin to the Low Weald of Sussex and the South Downs, and northwards across the Upper Mole basin to the North Downs, where the Merstham col marks a probable earlier outlet for this drainage to join the Wandle.¹⁰ The col at Withypits Farm (341352) marks the divide between the Ouse and Medway headstreams. Both are aligned with the geological strike on the northern flank of the Ashdown anticline and between them they have excavated an asymmetrical valley reaching the Wadhurst Clay and overlooked by a steep slope in Lower Tunbridge Wells Sand facing south-southeast. This slope is essentially an escarpment comparable with the larger Chalk and Greensand escarpments of the Wealden fringe; it is a fragment of a much-dissected in-facing escarpment which surrounds the Ashdown anticline. A line of springs near its base marks the presence of the Wadhurst Clay. Wherever it occurs, there is an associated sequence of soil types (a soil catena), with some modification where the Sand Rock at the top of the Lower Tunbridge Wells Sand obtrudes as a bare rock mass (Fig. 3). The recognition of

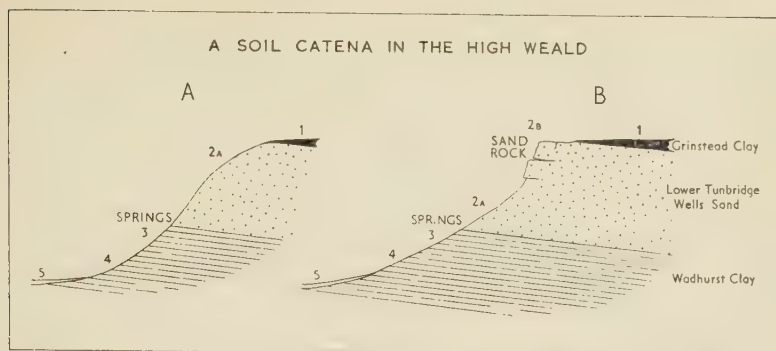


Fig. 3.—A. Soil catena found in the high Weald. B. Variation where Sand Rock forms natural rock outcrops. 1. Heavy clay soils on Grinstead Clay. 2A. Shallow sandy soils. 2B. Sand Rock outcrop. 3. Sandy downwash over Wadhurst Clay. 4. Heavy clay soils on Wadhurst Clay. 5. Loamy colluvium (accumulated downwash) at foot of slope.

such recurrent features in the landscape greatly facilitates the understanding of such complex regions as the High Weald and may well be the key to detailed geographical study in this area.

The road southwards (B.2028) crosses the Withypits Farm col and climbs to Selsfield Common. A strike-fault on the southern side of the valley brings down Lower Tunbridge Wells Sand again and its steep bounding slopes are seen soon after the road turns eastwards along the Medway–Ouse watershed towards West Hoathly. The broad amphitheatre above Gravetye Manor (357332) is the work of spring-head erosion by Medway headstreams. In its slopes are Sand Rock outcrops, and the soil catena figured in Fig. 3B is exemplified.

West Hoathly (363325) is sited on a small plateau on the Medway–Ouse watershed. From the churchyard there is a fine view southwards across the Ouse basin to the gap in the South Downs at Lewes through which the river makes its exit from the Weald. One of the Ouse headstreams rises in a ghyll in the foreground and minor landslips in Wadhurst Clay are seen. In this part of the High Weald, the drainage is less closely adjusted to structure than in the Upper Medway basin to the north; the sub-parallel Ouse headstreams run transverse to the geological strike. It has been suggested that this contrast is explicable in terms of the extent of the Pliocene (or Early Pleistocene) marine transgression in the southern Weald, and that the Ouse drainage, initiated on the emergent sea floor, is younger than the better adjusted Medway drainage. For an extended discussion of this topic, the reader is referred to Chapter VII in *Structure, Surface and Drainage in South-east England*.³

At Sharpthorne a deep col in the Medway–Ouse watershed is overlooked by a steep east-facing slope in Lower Tunbridge Wells Sand. The watershed is lower and more rounded on the Wadhurst Clay outcrop, which is marked by heavy brown clay soils and numerous ponds.

The Ashdown Sand rises to the surface just before Tyes Cross (383324), where a lane leads northwards into the Medway valley.

This part of the valley has been converted into a large reservoir by a dam near Walesbeech (398350) which maintains the water level at 245 feet O.D. This Weirwood Reservoir, completed in 1945, holds 1,240 million gallons and is designed to supply two million gallons daily to Crawley New Town, six miles to the west, and a further million gallons daily to the local Rural Districts of Uckfield, Cuckfield and East Grinstead. An article on the Weirwood Reservoir, with an aerial photograph, appeared in the October, 1955, number of *Water and Water Engineering*.¹¹

Hard mudstones and sandstones of the Ashdown Sand are exposed on the northern side of the reservoir, and the valley slope, with Sand Rock outcrops, again exemplifies the soil catena (Fig. 3B), bracken marking the sandy soils of the middle slope where downwash from the Sand Rock mantles the Wadhurst Clay outcrops.

A steep climb northwards leads to a plateau capped by Grinstead Clay into which deep ghylls are incised. This plateau, at about 430 feet, is one of several in the Upper Medway basin at this level on various Hastings Beds formations evidently marking a former "partial peneplain" into which the terraced Medway valleys have been incised. On either side of East Grinstead the road passes through deep sunken lanes in the Sand Rock, widened to accommodate the modern road. These lanes have been developed by the combined erosive action of wheeled traffic and rain wash over a long period. East Grinstead is a growing ridge-crest town. It was a borough and a market town in the thirteenth century and is now a minor regional centre and a residential town for London workers.

B.2110 leads out of the town through an impressive cutting in the Sand Rock and on to a broad ridge running eastwards to Hammerwood and Holtye. This ridge, the Kentwater valley to the north, and the Bolebrook valley to the south are all aligned with the west-to-east geological strike. The Cowden anticline gradually develops on the northern side, distinct from the Ashdown anticline and separated from it by the faulted syncline which becomes clearly defined between Ashurstwood, Hartfield and Groombridge.¹² These pronounced structural features are truncated by the plateaux and valley-benches of the terraced landscape; to the north, Dry Hill (433416) rises above the general plateau level as a monadnock, and is crowned with an Iron Age camp. B.2110 passes from Lower Tunbridge Wells Sand to Wadhurst Clay and, at Hammerwood, Ashdown Sand on the southern flank of the Cowden anticline. Holtye Common is a heathland on soils derived from Ashdown Sand; a pathway across it from 456394 leads down to Furnace Farm in the Kentwater valley, a valley which is almost aligned with the crest of the Cowden anticline, and which thus exemplifies "inverted relief" (Fig. 2).

The Kentwater valley is remarkable for its relics of the former Wealden iron industry based on clay-ironstone nodules from the Wadhurst Clay and charcoal fuel from local woodlands. Accounts of this industry include those by Sweeting¹³ and by Straker,¹⁴ who lists numerous sites and place-names indicating former ironworking. The oldest sites are associated with Iron Age hill-top camps such as Dry Hill and Saxonbury Hill, near Frant, but in the medieval period the industry was sited in the deep headwater ghylls where water-power was available to work the crushing hammers and the bellows. Reservoirs, known as "hammer ponds", were constructed in these ghylls to increase and conserve water-power, and two of these may be seen in the Kentwater valley. Furnace Pond (454399) is impounded by a high dam crossed by the lane, and the remains of foundations of furnace and forge may be seen beside the stream. Sandstone quarries in Ashdown Sand are seen along the northern side of the pond and there are overgrown ironstone pits in the woods on the Wadhurst Clay to the north. The industry, unable to compete with developing coalfield iron industries, died out in the late eighteenth and early nineteenth centuries, and the hammer ponds are in process of silting. At the head of Furnace Pond zones of vegetation pass from fen to alder-swamp and eventually dry woodland; more advanced stages in natural reclamation are seen in the higher pond at Scarlets (443400), a mile upstream.

A quarter of a mile east of the inn at Holtye a trackway leads down to the Sussex Archaeological Society's site (462388) where part of the London-to-Lewes Roman Way has been exposed. The full section was described and photographed by Margary¹⁵ in his book on the Roman ways in the Weald. The portion now visible is metalled with iron slag and shows traces of wheel ruts, but it is deteriorating rapidly under exposure to the weather. The route followed by this Roman way may be picked out on the Ordnance Map, and this portion is aligned with the segment which survives as the High Street in Edenbridge, to the north.

From Calstock Cross-roads (476390) B.2026 runs southwards along a flat-topped spur towards the Medway valley. A strike fault near Tye Farm, truncated by the plateau surface, brings Lower Tunbridge Wells Sand down against Wadhurst Clay in the Hartfield syncline (Fig. 2). As the road descends from the plateau (481378) the steep bounding slope in Lower Tunbridge Wells Sand is well seen above Perryhill Farm and there is a good view southwards across the Hartwell and Medway valleys to the high valley bench cut in Ashdown Sand south of Hartfield, backed by the rising ground of Ashdown Forest.

Hartfield is sited on a low terrace of the Medway about 50 feet above the present valley floor on its southern side. A steep climb (B.2026) leads to the high valley bench at Newton's Hill, which is incised by the deep Posingford ghyll. At Chuck Hatch there is a well-marked back

to the valley bench and the road climbs into the oak-birch heathland of Ashdown Forest.

Ashdown Forest is an uninverted anticline, an upland mass of Ashdown Sand forming the divide between the Medway and Ouse drainage. Its morphology is in striking contrast with the dissected plateau country previously traversed. Camp Hill (468289) provides a good viewpoint. To the east the wooded hump of Crowborough Beacon reaches 792 feet, the highest point in the High Weald and possibly a remnant of the Mio-Pliocene summit plain² surviving on account of its position on an inner watershed. To the west the deep curving ghyll of the Posingford stream marks a notable example of headwater piracy, where an Ouse headstream has been diverted into the Medway drainage north of the col at Nutley (444284). Nearer at hand, on the western slope of Camp Hill, the vigour of headward erosion by Medway headstreams is well illustrated where a deep gully has been eroded along the line of a tank rut made during wartime manœuvres. The vegetation of Ashdown Forest shows considerable variety: the heathland is maintained by frequent fires but patches of birch and gorse scrub indicate succession to oakwood, and there are woodlands with oak, beech, birch, chestnut and sub-spontaneous pine, which also occurs in the "parkland" country of King's Standing. The soils include podsolized sands, exposed in a small pit a hundred yards to the east of Camp Hill, but there are many bands of mudstone and clay. Good pastureland in fields to the northwest shows the extent to which this land may be improved and upgraded. Southwards, the land falls away into the Ouse basin and the descent (B.2026) is made by way of Duddleswell.

At Fairwarp there is an abrupt change in the landscape where strike faults bring down Tunbridge Wells Sand in the Uckfield syncline (Fig. 2). Towards Maresfield the Ouse tributaries are incised in a broad, dissected plateau and fragments of the steep slope in Lower Tunbridge Wells Sand reappear. The landscape recalls that of the Upper Medway basin, with differences due to the contrast in drainage pattern (here more dendritic) and to the lower general level of the plateau remnants. In terms of the division of relief types suggested in the Land Utilisation Survey Report this is a passage from the "zone of marked relief" of the southern slope of Ashdown Forest to the "zone of wider, steep-sided valleys".

Uckfield (A.22) was once a ridge-crest village but is now a small town with a marked linear pattern extending across the incised valley of the Buxted Ouse. Southwards a low ridge marks the western end of the Heathfield anticline and a gradual descent is made to East Hoathly (A.22) which stands on the last of the low sandstone ridges.

Throughout the High Weald, the distribution of improved land, whether as pasture or as arable, is patchy and indicative of the effort necessary to secure and maintain improvement. Characteristically,

mixed soils in areas where sand and clay are in juxtaposition offer the greatest possibilities.

The Cuckmere Basin and the Seaford Coast

The large Upper and Lower Vert woodlands are on Weald Clay, and at Lower Dicker (554117) a lane leads southwards across the clay land to Upper Dicker, and then (B.2108) southwards to Berwick and Alfriston. Low terraces of the adjacent river Cuckmere are seen to the west and at Wickstreet (540088) a gentle rise leads up to the Lower Greensand ridge. The structure here (Sheet 319, Lewes) recalls that of the Poynings area; this Lower Greensand ridge marks the eastern end of the Mount Caburn syncline, and a brief return to the Weald Clay near Berwick station (where there is a brickworks) marks the Beddingham anticline (Fig. 2) aligned with the broad gap of Glynde Reach to the west. Berwick Common is again on Lower Greensand and the village is sited on the narrow outcrop of the Upper Greensand. The entrance to the Cuckmere gap is bordered by remnants of platforms described by A. J. Bull¹⁶ at 130 and 200 feet, and by a low gravel terrace on which stands the village of Alfriston.

The broad alluvial valley floor in the Cuckmere gap, with its drainage ditched, meandering river and water meadows is best viewed from High and Over (510010), a steep meander cliff on the western side of the valley. Southwards, as the gap opens to the sea, a fine pattern of meanders is seen. The tributary dry valleys on either side of the gap show the problematical curved pattern to which reference has already been made. The South Downs within the compass of this viewpoint present a landscape similar to that behind Brighton, with the addition of a broad belt of coniferous trees in the plantation above Westdean.

The road descends to Seaford, a coastal residential settlement which was once a port at the mouth of the river Ouse. In the fourteenth century the mouth of the river had been deflected eastwards by a shingle spit built by longshore drift. F. G. Morris¹⁷ has described the subsequent changes in the position of the Ouse outlet and the harbour. In the sixteenth century the sea breached the spit near Bishopstone, at the site of the present Tide Mills, and a "New Haven" developed here. In the next century the present outlet was cut, close to the village of Meeching, which then became known as Newhaven; it has since developed as a packet and ferry port. Piers and groynes were constructed to the west of the harbour to protect it from longshore drift and the present breakwater was completed in 1890. When the supply of shingle was cut off, coastal erosion was accentuated in Scaford Bay, and Seaford promenade suffers severe damage during southerly and south-westerly gales.

The road (A.259) skirts the alluvial flats of the lower Ouse at the base of an old cliff line broken by small cave-like embayments with old beach deposits. Beyond the harbour installation the cliffs are of Upper

Chalk with an Eocene capping. West of Newhaven the road crosses a ridge to the Peacehaven plateau, notable for its extensive bungalow settlement. Dry valleys, each truncated by cliff recession, are crossed at Saltdean, Rottingdean and Ovingdean and at low tide an excellent wave-cut platform, the present-day equivalent of the erosion surfaces on the South Downs dip-slope, is well displayed. A.259, continuing into the eastern suburbs of Brighton, completes the route.

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Elizabethan Manorial Surveys

D. MONTEITH

THE VALIDITY OF HISTORICAL GEOGRAPHY as a branch of geographic study is based on the truism that "an area like an individual is not fully explicable except in terms of its history"¹ but there are different interpretations of the form which studies in historical geography should take. One method which recurs many times is that which takes the form of successive reconstructions in chronological sequence, of the total geography of an area as it was at a number of cross-sections in time. But only rarely have these studies been based on a detailed analysis of the individual external features of the landscape—buildings, roads, field boundaries—chiefly because of the difficulty in finding adequate source material. As soon as one goes back beyond the eighteenth century, cartographic sources are extremely limited and as a result studies of the preceding centuries tend to be rather generalized, often deviating from the landscape itself and becoming economic histories. This may be because there is too great a dependence on the work of the historians, on their discovery, transcription and interpretation of the written records which are of necessity the chief source for the reconstruction of past complete geographies between the Domesday Book and the eighteenth and nineteenth century maps and statistical surveys. It is the aim of this article to indicate the value of a neglected manuscript source which is easy enough for the geographer, with some preparatory work, to transcribe, which is abundant enough to provide information for a wide area of England, and which is detailed enough to enable one to analyse all the separate elements of the contemporary landscape. In fact it is possible to map the information contained in the most detailed of this type of manuscript on a parish scale; thus close comparison of the past and present landscape, the true end of historical geography, can be made.

The manuscripts referred to are the rentals and surveys which were made in the sixteenth and seventeenth centuries. As a class of record they are by no means restricted to the Tudor-Jacobean period although this was the time of their proliferation. Their prototypes can be found in the detailed estate records kept and long preserved in the medieval abbeys and which are equally valuable in the reconstruction of a past landscape, although they are naturally fewer in number and more difficult to transcribe and interpret. Following the dissolution of the monastic estates, a period of land speculation led to the rapid exchange of properties, the leasing of ancient demesne lands, and the disappearance of the customary methods of agriculture which had for so long held tenure and field systems to a rigid pattern. In order to record

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such changes manorial lords instituted frequent surveys and the preparation of rent rolls for the resulting new holdings, demesne and tenanted, rural and urban. Occasionally maps were drawn to accompany these surveys and where they have survived they form our earliest examples of local cartography, but as W. J. Corbett, the historian, pointed out as early as 1897—

“As the surveys are not confined to particular estates or particular manors but make the complete circuit of the villages giving the abutments and compass bearings of the various parcels of land, only patience and ingenuity are required to compile a tolerably accurate map of each village as it was at the date of the surveyors’ visit; and Elizabethan maps are not of such every day occurrence as to render their recovery a matter of indifference. Of course in some cases owing either to ignorance of the size and shape of the wastes or to the complete obliteration of old land marks by parliamentary enclosures it may be difficult to compile a map; but even in these cases the surveys themselves cannot fail to be illuminating, containing as they do a detailed statement of the arrangements of each village such as can nowhere else be obtained.”²

Naturally, while the surveys have many features in common, they are extremely varied in format, in the amount of topographical material included and in the extent of their coverage (some were definitely concerned only with the properties of a single manor, so that the town or village which contained tenancies of several manors will not be covered by any one survey). However, where several documents for one area survive it is possible to check for inaccuracies and omissions, and in the first instance it is obviously wisest to choose for study areas where there is an abundance of material. A study of the town and parish of Saffron Walden, where there is such an abundance largely due to the long continuity in the manorial lordship of the area and the diligence of the Essex Record Office in the collection of documents, has been undertaken. In this study the value, limitations and difficulties inherent in the use of documents of this class for the reconstruction and mapping of a past landscape have been made evident, and some account of them is given here.

The least valuable, in a topographical sense, of the surveys were those which consisted merely of a list of the tenants of the manor with a note of the tenement or acreage held and the rent owed on it. The most valuable were those which were systematic compilations, drawn up street by street or field by field as the surveyor proceeded about the town or parish. As compass directions, and streets, roads, paths, fields, furlongs, strips, farms, cottages, woodlands, and boundary marks are all named, the locations of many of these features can be determined with the aid of the earliest maps available for the area. While this basic information concerning the cultural landscape can be obtained from most of the detailed surveys, each survey has individual characteristics according to the particular requirements of the lord of the manor

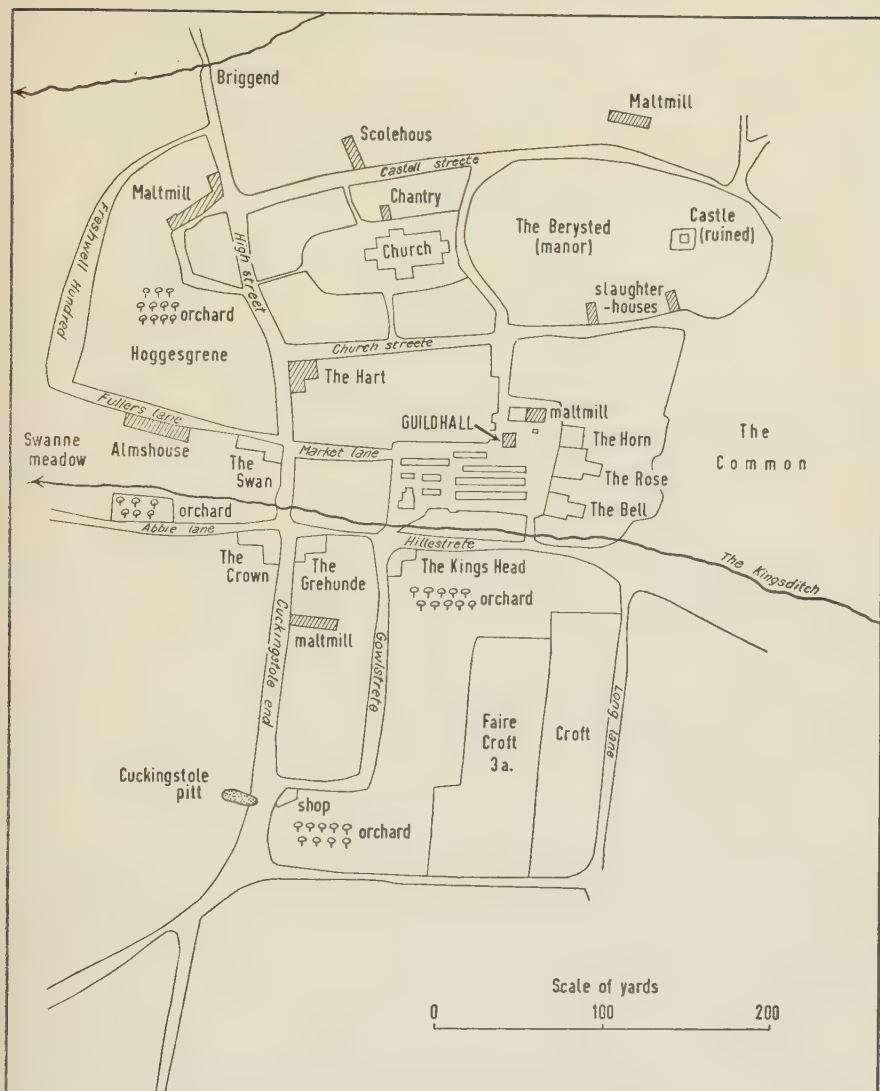


Fig. 1.—Town plan of Saffron Walden about 1600, based on street names mentioned in sixteenth and early seventeenth century surveys. No attempt to show all buildings has been made.

or the diligence of the surveyor or special Court of Survey, in carrying out their "Articles in charge". There are frequently attached memoranda, interpolations or addenda containing much of interest to the historical geographer. For example, there may be intimations as to the existence and sites of mills, fishponds, commons of pasture, meadows, coppices, sheepfolds and even "mynes of coles or other commodities, quarrys of freestone, Roughstone, or Slatt, gravell sand or chaulk . . . where doth the same lye and who reapeth the comoditye thereof".³

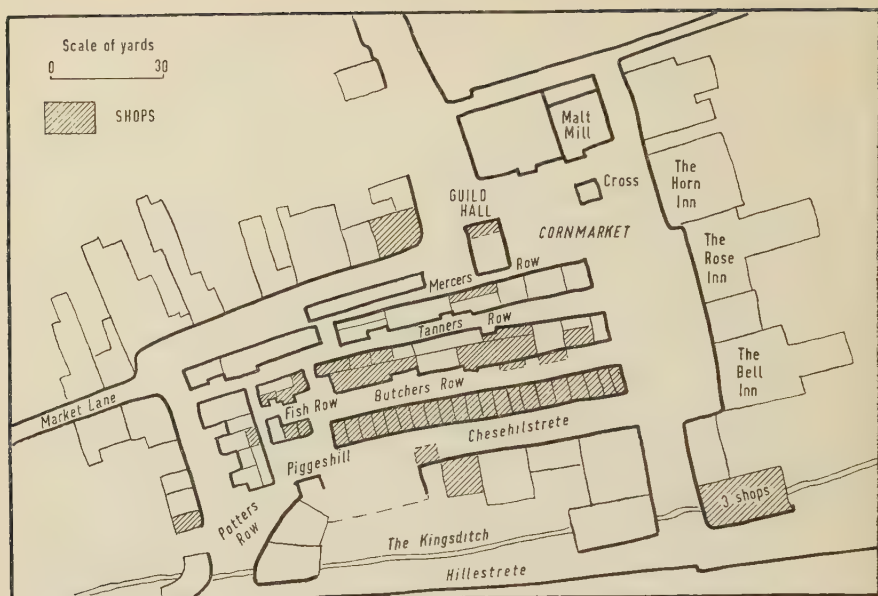


Fig. 2.—The market area in 1620.

Several separate rentals of the urban properties of the Manor of Walden (which owned almost every building in the town) were made during the period from 1500 to 1650, but the two found to be the most complete and detailed were one made in 1524⁴ and one in 1620,⁵ the intervening ones being used to trace the few changes which had occurred in the hundred years which separated them (a process which is aided by the surveyors' practice of reciting the history of the tenancy by surnames). The surveyors were so systematic in their records that they listed each property in the order in which it occurred in the street and gave the abutments on all four sides of the messuage or tenement. For example:

"Castle Street the Sowthe side proceeding westward. Messuage and yarde by the highwaie leadinge to the Greene on the easte and by the Castel hill in parte weste: buttinge southe in part on the common at the pinfold"

and—

"A Rowe at the west end of the streete past: at Potterowe by the street east. Beginning at the Cornerhouse over against Gouldstreetend and proceeding northward—

Widow Convenie a messuage and yard being the cornerhouse by the waies south and east, late Turtells and Hodges. The north part thereof is free and was sometimes Campions and Harisons. The south part built over the Kings Ditch is copyhold."

and—

"The lorde hath a close more north beinge the site of the maner called the Berysted. It is compassed about with tenements and yards on all

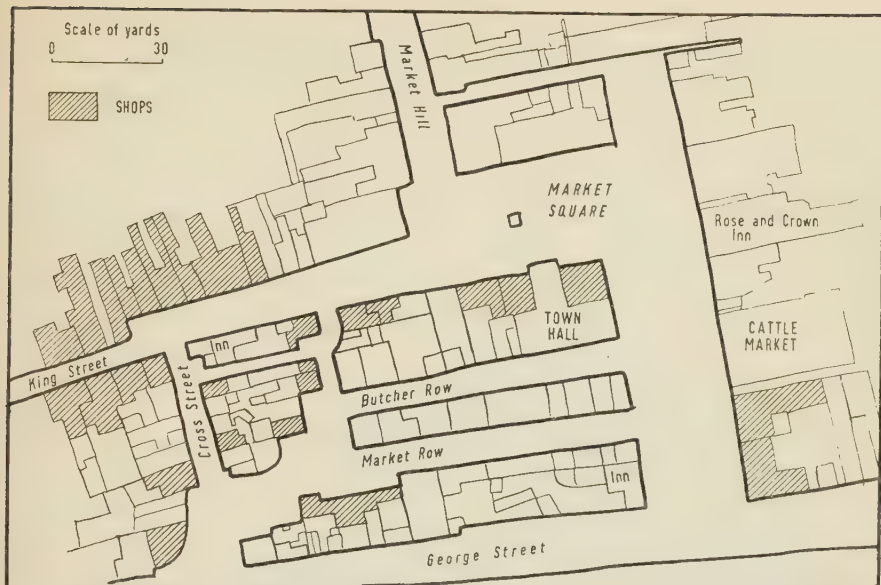


Fig. 3.—The market area to-day. The market rows have coalesced through the erection of enclosures across the narrow alleys.

parts. It hath a gatewaie at the southeast corner leading into the Church-streete. j a' dim' ($1\frac{1}{2}$ acres).

Thus it is possible to make a plan of the town based on the street names mentioned in the survey (Fig. 1) and to discover the number of buildings liable for rent in each street, and sometimes whether they served special functions such as the inns, shops, maltmills, stables, public buildings and barns which were designated in these particular rentals. There is no doubt, however, that a considerable amount of domestic industry (such as the all-important saffron drying) was hidden behind the simple term "messuage" and other sources must be sought for their elucidation.

In 1620 a total number of 375 buildings are described, of which 52 were shops, 7 were inns and 4 were maltmills, while such public buildings as the Moot Hall, Almshouses, Manor house and school as well as gardens, orchards and pinfolds are included, giving a very vivid visual impression of the flourishing market town. The rental also reveals that the increasing population and commercial expansion were being accommodated in the many open spaces which had characterized the medieval town rather than by a real expansion, which did not in fact take place until the eighteenth century—"three little garden plats now built into shops" is one example of the process. But still the density of building was low, roughly three per acre, and many gardens and orchards survived except within the crowded nucleus of the medieval market place. Here almost all the shops described in the

rentals were situated in narrow rows, a single trade being concentrated in each row, e.g., Butchers Row, Mercers Row. They originated in the rows of stalls across the earliest market square and are still a visible feature of the town plan. Also within this central core were three of the largest hostelryes, the timbered Moot Hall with its basement gaol (Guild Hall), and the ancient horse-powered manorial mill (Malt Mill). Figure 2 which shows these features was constructed from the information obtained from the 1620 Survey and with the aid of a map made in 1750. It must be stated that accuracy of position of the buildings is greater than that of their shape which must remain diagrammatic in most reconstructions of this kind, even where such details as the following are included in the survey—

“The corner howse by the streete northe and weste and a little yarde of the lordes east extending south with a tounge to the messuage of Mr. Harris quondam Hubberds.”

“extending northe with a gatewaie to Churchestreet by the backsides of the former tenements and yarde of the lordes.”

In a similar manner every street and building in the town could be described and mapped, reconstructed from the vivid details recorded by a sixteenth or seventeenth century surveyor, but the purpose of this article is merely to indicate the possibilities of these documents in a study of urban morphology and evolution and not to describe the town itself.

Complementary to these urban rentals is a very detailed land survey of the kind described by W. J. Corbett which reveals that a complex pattern of fields and settlement surrounded the Tudor town.⁶ One can trace the progress of the surveyor as he proceeded over the whole parish in 1605, compiling his rental strip by strip and field by field. He recorded each piece of land, its name, acreage, ownership, tenant, status and abutments on other lands, lanes, balks, highway, enclosure, or home croft of farmstead or cottage. Thus one has a complete record of every field whether it was a half-acre strip or a huge sheepwalk, a coppice of one rood or a woodland of a hundred acres. Like the pieces of a giant jigsaw puzzle this information, with the help of the surveyor's own compass directions and the earliest maps of the district, can be assembled into a very detailed map or series of maps which are of great significance in the elucidation of the former cultural landscape. The existence of several other surveys of this part of Essex for the same period allows checking for accuracy even if they do not always add extra information. One made in 1638 contains a complete list and details of all the woodlands in the manor, while another, drawn up in 1600, records all the leases of the demesne land, including the medieval sub-manors which had become yeoman farms. Analyses of the proportions of their arable, pasture, ley, and meadow lands are included and even notes about the differentials in rents based on the varying fertility of land in the different parts of the parish.

Two extracts from the 1605 survey are quoted here to indicate the type of material available and the way in which it is presented.

(1) "Willowfield at Castlecrosse

A fulong at Castlecrosse buttinge east upon the way to Little Walden, West upon Westlie way, proceeding northward

Bery Appletons alias Shipmans	The lord a close called Bery Appletons (now Shipmans) heretofore in two pieces now laid together containing 4 and 5 acres. 9a.
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The lord a piece next adjoining inclosed together with the piece next following butting west upon the waterslade. 1a.

Shipmans acre	Widow Halfefeade a piece called Shipmans acre heretofore belonging to Trinity Guild held freely of the lord by deed 20th. Henry VIII . . . 1a."
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(2) "Other grounds more south between Swards End way on the north, Smallbridge Field on the west and the grounds of Mr. Nicholls called Arches on the south.

The lord a meadow inclosed by the way north and Shipcote field south and butts east on the said way. It is taken out of Shipcote field. 2a.

Shipcote Field	The lord a great piece of arable adjacent more south enclosed with four pieces following and called Shipcote Field, by a pightle of the lords on the east and it butts in part on Milfield. 13a.
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The Almeshouse a piece at the side of the said close by the hedge on the west butting north on the highway. 1½a.

In Barliebreade	John Spicer a parcel more east in the same close by the former great piece of the lords on the north butting west on the Almeshouse piece, east on the balk or way between two pieces of the lords land at Milfield corner. 1a."
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Examples of pieces recently "laid to the sheepwalk", or of "a cottage and curtilage lately taken out of the said green newly granted by copy", or of "Hogscroft" with "a little grove in the middle part of it where the way called Shipcote lane sometime passed through", or of "the scite of the manor of Pounces with barns stables and yards", or of the countless unenclosed narrow strips, could be cited to indicate the many different facets of the total picture of the landscape of the parish which are revealed by the survey. It will be seen that a painstaking reconstruction of the seventeenth century parish, of its settlement, fields, roads, paths and woodlands is possible.

A mass of similar topographical material is available for very many parishes in England where surveys of this period have survived and are now housed in the respective County Record Offices. Record Office collections vary greatly and while some may not possess all the

extant surveys for parishes in their districts, County Archivists can usually advise where surveys can be seen, for instance, those which remain on private estates or in parish chests. For example, Essex Record Office has photostat copies of such surveys and of others held in the British Museum or in Cambridge college libraries; the Public Record Office holds surveys of Crown-held lands and manors. It would not be difficult for anyone interested in using sixteenth and seventeenth century rentals and surveys to establish quickly at a local Record Office its holdings or records of such documents, which are of a type so ubiquitous that there can be little doubt that all counties would hold some.

As an aid to the transcription of the documents two publications of the Essex Record Office are invaluable; these are *More Examples of English Handwriting* (1950) and *Examples of English Handwriting 1150-1750* (1954).

Even if only those areas were studied which are comparatively simple in their manorial structure, where more than one survey for the particular period is extant and where the existence of fairly detailed Tithe, Enclosure or other maps enables easier reconstruction by their record of landmarks and field names which have since disappeared, then much illumination of the Tudor geography of England would be possible. When collated and mapped the information obtained would lend itself to many valuable studies. It would afford a detailed picture of towns and parishes as they were in a little explored cross-section of time and so enable more scientific and valid generalizations to be made than those based on the views of early topographers. There is also sufficient information available to allow close comparisons with the earliest extant maps and the elucidation of the evolution of the individual elements of the urban and rural landscape. More important still, one could discover the degree to which the present cultural landscapes of different areas are influenced by their pre-enclosure histories. All these studies lead to an estimation of the degree of antiquity in the present settlement and field patterns, and as this varies from area to area it is a factor in the differentiation of one region from another and is thus worthy of geographic study.

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- ³ Essex Record Office. D/Vm 20.
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The Place of Geography in Town and Country Planning

J. N. JACKSON

SECTION 5 (1) of the Town and Country Planning Act 1947 states categorically that the officers of "every local planning authority shall carry out a survey of their area and shall submit to the Minister a report of the survey together with a plan indicating the manner in which they propose that land in that area should be used and the stages by which any such development should be carried out." Herein lies abundant scope for the geographer. My purpose in writing this paper is to interest the student and the teacher of geography in the possibility of a career in Planning, and to suggest some of the difficulties which must be overcome by the diligent applicant. It is not sufficient for geographers to remain aloof and to criticize the follies of planners from some academic pedestal or from the steps of a coach on a hectic field week. They must penetrate the heart of the planning machinery and establish through competent field surveys that sound proposals for land-use development can be based only on the solid bedrock of precise scientific investigation. One must diagnose before one can heal or, in the inspiring words of Patrick Geddes, "we cannot too fully survey and interpret the city for which we are to plan—survey it at its highest in past, in present, and above all, since planning is the problem, foresee its opening future. Its civic character, its collective soul, thus in some measure discerned and entered into, its active daily life may then be more fully touched, and its economic efficiency more vitally stimulated."¹ This is surely, more than of any other subject, the province of geography, and to this aspect of planning the geographer can, should and indeed must make his pertinent contribution.

Though responsibility for framing and administering a national policy on the use and development of land rests with the Ministry of Housing and Local Government, planning is primarily a local government service. It is the local planning authorities, i.e., the councils of the administrative counties and of the county boroughs, who are responsible for the survey of their areas and for the preparation of plans showing how land will be developed. The more enlightened of these councils now demand a specialized background or training from their survey personnel. Advertisements appear under "Public Appointments" in the columns of *The Times*, *Manchester Guardian* and *Daily Telegraph*, and in weekly journals such as the *Surveyor*, the *Economist* and the *Municipal Journal*, requesting applications from "graduates with a degree in either Geography, Economics or Sociology and/or experience

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of research with a local planning office for the post of Planning Assistant (Research)." The commencing salary offered to a graduate with no previous experience frequently lies within a grade which will rise to £1000 per year. At a lower level a good school-leaving certificate in Geography, coupled with ability in the techniques of map drawing and presentation, represents an acknowledged stepping-stone to the grades of draughtsman, cartographer, tracer, junior planning assistant or articulated pupil. The applicant who obtains a place on a short list will normally be interviewed by a small sub-committee of the main Planning Committee composed perhaps of the chairman and two lay members, advised by the Planning Officer or his deputy.

The successful candidate takes his place in the planning team with the architect, engineer and surveyor, the old-established triumvirate who dominate the planning profession and who sometimes regard their new colleague of the Social Sciences with at least a modicum of suspicion. Qualifying epithets such as "back-room boy," "research wallah" or even "geographer-planner," though not necessarily used in a derogatory respect are not exactly complimentary. The other professions still tend to consider themselves as the "true planners" and remain dubious as to the worth of geography. This standpoint emerges because the geographer is penetrating a field which through historical tradition is still regarded as the prerogative of the architect, engineer and surveyor—a natural enough standpoint because the planning legislation of the nineteenth and early twentieth centuries was closely associated with the improvement of sanitary and housing conditions within towns, and also because the present status and significance of planning within the national life can undoubtedly be attributed largely to the initiative and circumspection of these three basic professions. Nevertheless the attitude remains inconsistent with the realities of the current situation for, as already noted, survey has become an obligatory legal requirement for all local planning authorities throughout the country. These duties cannot be abrogated even by default, and there is a range of ministry circulars, statutory instruments and parliamentary regulations which define closely the scope and content of the official survey requirements.

The Schuster committee on the Qualifications of Planners² was conscious of the situation in 1950 when it recognized that "planning authorities must start with a clear conception of the economic and social objectives which they wish to attain and these objectives must be harmonized in a single coherent policy or plan." The recommendations followed naturally from this premise. Thus, "it will be clear from the whole tenor of our conclusions that . . . persons who have received a university education in subjects other than architecture, engineering or surveying should be regarded as equally eligible to take a post-graduate course in planning, and having done so and obtained the necessary practical experience, are equally well qualified in planning."

Or again, "means should be found by which membership of the (Town Planning) Institute can at once be broadened by the admission to it of persons now practising in planning, and well qualified by experience and education to do so—e.g. university graduates in economics, geography, sociology, etc., who have worked for some years in a senior position with the planning authorities."

Pious words without the power of legal sanction to enforce their adoption are however of little value, and, though chary of complete implementation, the Town Planning Institute are to be congratulated on amending a part of their admission regulations. A candidate with an approved degree in Geography is now exempt from the Intermediate examinations of the Institute.³ If he has not obtained this standard, he is required to submit five testimonies of study, and seven written papers. The testimonies involve a measured drawing of a building constructed prior to 1840 together with five freehand sketches; an analytical study of a square, street, terrace or group of buildings; a chain survey and levelling of 5 acres to a scale of 1/500; the design of a set subject; and a working drawing of a feature of this design. The written examinations incorporate papers on the elementary construction of buildings, roads and bridges; surveying and levelling, in which there is also an oral examination; the historical development of planning from Greek and Hellenistic planning through the mediaeval and renaissance periods to the present day; central and local government; outlines of planning law; and applied geology and economic geography.

Having passed these preliminary stages to the satisfaction of the examiners the student is then faced with the Final Examination, both parts of which, with the sole exception of the written paper in social and economic organization, must be taken by the graduate geographer. The Final Examination requires the student to prepare both general and special studies, and to pass another series of written examinations. The testimonials are more advanced in character and include either three drawn exercises in design relating to specific problems or a 5,000-word essay on a geographical, economic or social topic; and a large-scale plan for a new town, town redevelopment or a rural area. The written papers cover the historical development of planning; social and economic organization; town planning practice; a sketch plan for an area which has been briefly inspected immediately prior to the examination; architectural and landscape design in relation to planning; civil engineering in relation to planning; the economics of land use, which incorporates valuation; and law in relation to planning.

The alternative to qualifying in the above examinations is to seek exemption from the examination requirements of the Institute by taking a recognized university or other course in Town and Country Planning. For the graduate geographer this line of action would normally involve at least three years of part-time evening study, with

2-3 evenings per week of lectures plus studio work and, in the final year, a thesis. University courses are offered by Durham, Manchester, Liverpool and London; there are exempting courses in the colleges of art at Edinburgh, Leeds and Nottingham, and at the Glasgow Technical College and the Regent Street (London) Polytechnic. Tuition in Planning, but not exemption from the Final Examination, is available in the Colleges of Art at Leicester, Wolverhampton, Birmingham, Cardiff and Portsmouth, and at the College of Estate Management, London. The discerning reader will have noted that at the present time there is not a complete coverage of the British Isles, and that there are no recognized courses available in planning to the west of a line from Manchester through Nottingham to London. The populous areas of Southampton, Portsmouth, Bristol and South Wales are thus deficient, as indeed are all localities which are inaccessible from the listed centres. Persons wishing to qualify in Town and Country Planning would therefore be well advised to consider the local availability of courses in this subject before taking up an appointment in a planning office—the alternative is to qualify through a correspondence course which can never be as satisfactory as personal tuition and regular contact with specialists.

Even though the burden on the graduate geographer has been lightened to a considerable extent by exempting him from the intermediate examination, it still demands considerable endeavour and remains no easy task for a geographer to obtain the requisite planning qualification. Many potential research workers with a geographical background must be discouraged from entering the planning profession by the formidable array of specialized knowledge which is required of them and, if already within the local government service on a junior grade, they are virtually debarred from the higher posts unless the hurdles of the Institute's final examinations can be surmounted. This position should be of considerable concern to the geographical world because the implications are that the survey and research work of planning departments will be undertaken by persons with a training in other than the social sciences, and that the positive contributions which the geographer can make to the formulation of sound planning policy will be overlooked, ignored or waived aside.

To avoid this impasse there is perhaps scope for the introduction of a separate membership for research personnel under some such title as Associate Member of the Town Planning Institute (Research). The danger of such a policy is that specialists working within the planning profession are planners by virtue of the very character of their work, and that such a differentiation would be invidious to the geographer who is adept at the design aspects of planning. On the other hand it would broaden the foundations of the Institute, substantially strengthen its membership and enhance its influence. There is also the precedent of the legal practitioners who, if at least 21 years of age and duly

qualified, have the distinction of Legal Associate bestowed upon them after passing only two written examinations. These examinations are both concerned with their own subject-matter of law; one paper is on the law relating to town and country planning, and the other on the law relating to local government, public health and housing. There are neither testimonies of study nor papers on design, engineering or economics. If this profession which is concerned with but one aspect of planning—namely that of the legal interpretation of parliamentary enactments and their associated orders and regulations—receives such differentiation, why not the research worker who brings his specialized training and experience to bear on the analysis of particular planning problems? These remarks do not deny the importance of law to the implementation of planning, but is not the initial or basic survey work of equal significance? Considerable further changes are necessary if the admirable Schuster recommendations are to be implemented. In essence the present position is that although no geographer would wish to vie with the artistic skill of the architect-planner in designing a housing layout or an industrial estate, he must compete for recognition with every surveyor or architect who has acquired the planning label and who *ipso facto* deems himself competent either to undertake sample surveys or to interpret complex statistical data on population or industrial trends. Survey is not, as many planners would have us believe, mere intuition or common sense or a job to be relegated to the office junior; it is formulated on the basis of cumulative experience and knowledge, the approach is scientific and methodical, and the results must provide the basis for any competent planning scheme.

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² Report of the Committee on Qualifications of Planners, H.M.S.O., 1950, Command 8059.

³ *Examination Syllabus*, Town Planning Institute, 18 Ashley Place, London, S.W.1. (Price 1s.)

Japanese English-Language Sources of Information in Economic Geography

ALAN D. WALTON

OVER the past fifteen years there has developed an estrangement of British interest in Japanese geographical affairs which has its origin in the decisions of the Anglo-American Joint Chiefs of Staffs Committee to treat the Pacific theatre of operations in 1942 as an American assignment, the occupation of Japan by a dominantly American force in 1945 and the administration of the "Japanese Experiment" by a Supreme Commander for the Allied Powers who was the instrument of the United States Government. Since 1948, however, there have been published in Japan several sources of data in the context of Economic Geography in the English language which are either inexpensive or else available at a price which is in keeping with that of journals of international reputation of similar quality and format. They present, with great competence, a totally adequate review of the place of post-war Japan in world economics and in the Far Eastern and Southeast Asian trading areas and they contain, at the national level, analyses of the rebuilding of the Japanese industrial machine as a whole and in terms of individual industries. These sensible, accurate reports on national recovery and progress as seen from within Japan and the discussions of current problems which face their industries should go far in bringing up to date British notions on Japanese industrial practice, conditions and technology and on the style and quality of their products.

In all the publications which are mentioned in this review there are first-class statistical data in tabular and graphic form. Broadly speaking pictorial material is scarce and maps are rarely used. There is hardly any attempt to give locational data within Japan even at the prefectural level let alone for minor civil divisions, but at the national level and in broad, regional considerations the material is excellent. The statistics are almost invariably referred to a source in a government department or agency or to the Bank of Japan which is the central bank of the country.

Two annual publications will be found to be very useful. The first is the *Japan Economic Year Book* which is published in May. It may be purchased through booksellers in this country at about 26s. although its published price in Japan is 10s. This annual is a pocket book and contains 198 pages of well-classified information. It may be summarized as falling into four sections. The first (64 pages), on "Economic transitions," deals with aspects of the national economy ranging from fiscal policies to labour and transport problems. The second deals with progress and developments in individual industries (50 pages), and the third is a statistical section with data up to the end of December of the year prior to publication covering topics from Business Indices and Budget Accounts to Population, Fisheries and Agriculture. The fourth section is a classified and fully indexed list of major companies, their addresses, banks and products. The *Yearbook* ends with a useful table of Japanese weights and measures with their foreign equivalents.

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The second annual has no published price but enquiries should be made to The Bank of Japan, 4-8, Ludgate Hill, London, E.C.4. It is *Japanese Industry* and is published by The Foreign Capital Research Society whose chairman is the Governor of the Bank of Japan. The most recent edition (1956) is the seventh revised edition of "Japanese Industry after the war . . . Foreign Investment Possibilities". In this journal a successful "attempt has been made to give a full picture of Japanese industry by describing the conditions of small enterprises as well as major industries". The range of topics in the 112 pages of the book is very wide and thorough; the position of each industry is given at the end of the previous year against the background of its post-war recovery record. General statistics of national production for the period 1950 to 1955 for each industry are given by years and the sources are clearly credited. Current problems are discussed, qualitative details of exports and imports by countries are given and future prospects are assessed. A valuable feature is a list of the major firms in each industry together with their linkages with foreign companies and agreements on licensed production of patented articles. These lists also give some evidence of the locations of some mines and plants with data on their output which might be put to good use in a regional analysis. The volume contains a dozen coloured plates which give good impressions of the Japanese industrial scene and the modern nature of their plants and products.

Of the highest importance in any discussion of the economic affairs of Japan is *The Oriental Economist*, which, like its British counterpart, contains commentaries on the latest political, economic, financial and industrial developments in the Far East. The articles are adequately furnished with detailed and well-ordered statistical data whose sources are quoted. It is attractively bound, well printed on high quality paper and is a very handsome journal by any standards. It appears monthly and subscriptions may be taken out directly with the publisher at *The Oriental Economist*, Nihonbashi, Tokyo. The annual rate is 10 dollars (U.S.), about £3 10s., for which mail transfer can be simply arranged through any bank.

Trade and Industry of Japan is a well-written and most attractive quarterly journal which is published by the Japan External Trade Recovery Organization (JETRO) of the Ministry of International Trade and Industry (MITI). This is an authoritative journal and each edition has special articles on products and industries of topical interest. By far the most important and useful information to British readers using the journal as a source of basic data in economic geography are the annual analyses of the foreign trade of Japan. That for the calendar year 1955 was written in May 1956 and published in No. 17 of the journal in October 1956. These reports are divided into chapters of which there are three in the current edition. The first is an introduction on the general position of Japanese trade overseas, its analysis and problems for the immediate future. It is followed by a survey of trade by commodities in separate export and import sections, and the final chapter of the trio is an exhaustive breakdown of trade by countries to which there are 44 contributions. In all the sections the reading is well documented with statistical tables and graphs, clearly printed and well written with abundant, detailed information which is mainly concerned with a comparison of the past year's performance with that for previous years. Articles on specific industries, e.g., the automotive industry, are

well illustrated and very up to date. They should go far to dispel the many ill-founded and emotion-based ideas which are, unfortunately, still current in Britain on Japanese industrial practices, working conditions, technology and quality of products. The journal is obtainable from the Japan External Trade Recovery Organization, Yusen Kayabacho Building, 12, Kayabachochō, 1-chōme, Ote-machi, Chiyoda-ku, Tokyo, at about £2 10s. per annum and *pro rata* for single copies.

The Japanese banks have made useful contributions to this field of interest in the house journals which have been published recently and which are on a par with those of British banks. Monthly there is the *Monthly Circular* of the Mitsubishi Economic Research Institute of Tokyo which is obtainable at about £2 2s. per annum from the Institute at Naka 8th Building, Marunouchi, Chiyoda-ku, Tokyo. Quarterly there are the *Fuji Bank Bulletin* now in its eighth annual volume, and the *Sumitomo Bank Quarterly Review of Economic Conditions in Japan* which began publication in April 1955. These are well-prepared journals whose interests range far beyond the usual banking and financial topics. They contain many reviews of progress by specific industries, over-all appraisals of the general economic situation in Japan and the economic climate of Southeast Asia, and discussions of current industrial problems. There is the usual dearth of locational information within Japan but the discussions of the prospects for future export and import trade and the analyses of trade patterns are useful and forthright.

Bi-monthly two informative but less ambitious news sheets are issued. The Industrial Bank of Japan publishes its *Survey of Japanese Finance and Industry* and a newcomer is the *Sanwa Survey* of the Sanwa Bank of Osaka which began publication in September 1956. These contain brief articles on industrial developments and the latter aims at reporting on other industries than textiles with priority given to our export trade although naturally a journal issued in Osaka will have many commentaries on the progress of the various branches of the textile industry, especially since the bank intends to utilize its close relations with "industries large and small" and to provide "interesting information voluntarily offered by our clients".

The most frequent publication is a very concise and compact air-mail news-letter, *The Weekly Review of Economic Affairs in Japan* of the Bank of Tokyo. The information herein is "current and choice" and is mimeographed on air-mail weight, flimsy paper. It is received from the bank's London office ten days to a fortnight after the date of publication in Tokyo. Although there is much information on financial and fiscal problems from the banking standpoint there are useful notices on foreign trade, production by industries, market conditions, fuel supply problems and such topics as the age of installed machinery.

These house journals can be obtained from the London offices of the appropriate banks on request. The addresses are:

The Fuji Bank Limited, P.O. Box 547, Salisbury House, Finsbury Circus, London, E.C.2.

The Sumitomo Bank Limited, 4, Copthall Court, London, E.C.2.

The Sanwa Bank Limited, Garrard House, 31-45, Gresham Street, London, E.C.2.

The Bank of Japan, 4-8, Ludgate Hill, London, E.C.4.

The Bank of Tokyo, Limited, 7, Birchin Lane, London, E.C.3.

Readers who prefer to deal directly with Japan for books will find that the Maruzen Company, Limited are most helpful. Considerable savings might be effected on such books as the *Japan Economic Year Book* by correspondence with either the publishers who are *The Oriental Economist* or the Maruzen Company, Limited at 6, Nihonbashi Tori, 2-chome, Chuo-ku, Tokyo, or P.O. Box 605, Tokyo Central.

From the information contained in the journals mentioned above and the *Year Book* it is not difficult to obtain wholly adequate information at the national level on the post-war revival, the current problems and position, the import and export markets and the future planning and prospects of the Japanese economy as seen from within the country.

Textbooks for Secondary Schools

New Titles and Trends

L. J. JAY

IT IS BY NO MEANS FORTUITOUS that the increased number of children now passing through our secondary schools should coincide with a distinct "bulge" in the output of works written specifically for the use of those pupils. The mounting pile of geography texts which have been sent in recent months to the Association for review illustrates vividly this sharp rise in the book-rate. The following notes give a brief indication of the scope of a number of new textbooks.

During the nineteen-thirties most geography textbooks written for secondary (i.e. grammar) schools conformed to a recognized pattern. The material for a 4- or 5-year course leading up to the School Certificate Examination was presented in a series of books covering the world continent by continent. A systematic treatment of geographical data was thus subordinated to the regional scheme. In 1939 there were more than a dozen such series of books available, of a page size approximately 5 inches by 7½ inches. They varied in length and emphasis, but most of them contained photographs, sketch-maps and line-diagrams, with exercises and an index to stimulate intelligent use of the contents. To-day, several of these pre-war titles are still available, having been revised or entirely rewritten. Others have disappeared, to be replaced by new works following the familiar pattern.

Yet although many of these pre-war features persist, new trends can now be discerned. It is becoming more common for a team of writers to collaborate in the production of a new series of textbooks, and the names of women authors occur more frequently. A larger page-size is being tried, and several new works are Crown Quarto, i.e., 10 inches by 7½ inches so that they approximate to the size of the school atlas. Above all, the post-war period is notable for attempts to organize the subject matter of geography

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on less academic lines in order to provide courses for technical and modern schools which achieved secondary status by the Education Act of 1944; in particular, this experimentation has produced an alternative to the regional approach.

Firstly, there are four new series of books on the regional pattern. *Modern Geographies* by T. Herdman and A. Hurworth cover the world in three volumes; book 1, *The Southern Continents*, v + 195 pp., 1955, 7s. 9d.; book 2, *The Northern Continents*, vi + 223 pp., 1956, 8s. 6d.; book 3, *Europe and the British Isles*, x + 239 pp., 1957, 8s. 3d. Similar in style to the well-known *Geography for Today* series by the same publishing firm, Longmans, Green & Co. Ltd., but less detailed in content, these books are designed for use in schools where limited class time is available for pupils preparing for G.C.E. and similar examinations. Thus the chapter on New Zealand in book 1 occupies four pages, and that on Japan in book 2 has eight pages. Philip & Son Ltd. issued in 1957 the first three of six books in a new series "to suit the needs of post-primary schools"—*Global Geographies*, edited by A. E. F. Moodie: book 1, *A First Look at the World* by A. E. F. Moodie, 223 pp., 8s. 6d.; book 2, *The Southern Continents* by Eila M. J. Campbell, 370 pp., 10s. 6d.; book 3, *Asia and the U.S.S.R.* by E. M. J. Campbell and D. W. Shave, 310 pp., 9s. 6d. The detail in these books may be gauged from the fact that there are 35 pages on New Zealand and 31 on Japan. *Britain and Overseas* by R. C. Honeybone and Mary G. Goss, 196 pp., 1956, 7s. 6d., is the first of a new series of five books to be edited by R. C. Honeybone and published by Heinemann Ltd. under the title of *Geography for Schools*. This book contains a number of O.S. map extracts as part of the material, and weaves many of the exercises into the fabric of the chapters instead of putting them at the end. The *Oxford Visual Geographies*, edited by Audrey Hicks and published by the Oxford University Press, follow a regional pattern of treatment, but possess distinctive features not found in the books already mentioned. *Australia, New Zealand and the Pacific* by O. H. K. Spate and *Africa* by D. A. Sherriff are the first titles which appeared in 1956. Each has 96 Crown Quarto pages (10 × 7½ inches) and costs 15s. There are several photographs on almost every page, and maps in blue and black, but no exercises. Although it is claimed that the series can be used in class their price may make the school library a more likely abode for these attractive volumes.

Next, three additions to existing series: *South and North America* by E. O. Robinson, xlv + 236 pp., 1957, 9s., combines in one volume two books of his series of *Regional Geographies* which were published separately by Macmillan & Co. Ltd. a few years ago, and which were reviewed in *Geography*, vol. 39, 1954, p. 225. *Asia and European Russia*, xii + 223 pp., Dent & Sons Ltd., 1954, 4s. 9d., completes the series of regional books by T. Pickles for middle and upper forms in Grammar schools. This book has numerous block-diagrams, sketch-maps and charts, but no exercises. In the *Grammar School Series* now being published by English Universities Press Ltd., a *General School Geography* by J. S. Hobbs has been planned to provide in five volumes a course up to "O" level of the G.C.E. The last volume was paradoxically the first to be issued and was reviewed recently in *Geography*, vol. 42, 1957, p. 128. The fourth volume—*General World Physical and Human Geography*, 200 pp., 1957, 9s. 6d., offers a year's work on a

systematic basis, to follow the more orthodox regional treatment which will be covered in the first three volumes. The page-size of these books is somewhat larger than average, measuring $5\frac{1}{2}$ by $9\frac{1}{2}$ inches.

Dissatisfaction with the orthodox study of one continent after another has lent support recently to an alternative method whereby the whole world is studied each year from a particular viewpoint. But no new approach is likely to succeed until textbooks demonstrating the application of its ideas are made available to teachers. Hence the significance of two new books which complete a series advocating this concentric method: *Fundamental Geography*, edited by Leonard Brooks and published by University of London Press Ltd. Book IV, *Man's Work and Needs*, by R. Abbott, 296 pp., 1954, 9s., offers a systematic treatment of world economic geography, while book V, *The World*, by L. Brooks and Miss E. M. Coulthard, 479 pp., 1957, 12s. 6d., completes the series. General geography is revised in an opening chapter followed by 364 pages of regional studies of the world. A final chapter considers selected economic problems. Designed for use by fifth- or sixth-forms, this book is encyclopaedic in its detail of small places. How many teachers, for example, could name at once three towns in the Yemen, or two in the Azores, and could locate readily the coaling stations of Diego Garcia or Charlotte Amalie?

Several new publications offer a world approach to economic geography. T. Pickles, whose *Physical Geography* was reviewed in *Geography*, vol. 42, 1957, p. 127, has now written a companion volume, *The Wealth of the World*, 335 pp., Dent & Sons Ltd., 1957, 9s., containing many new diagrams and clear sketch-maps. Roughly comparable in length, but more ambitious in scope is *A Modern Economic Geography* by H. A. Chapman, xvi + 352 pp., Pitman & Sons, 1957, 15s., for in addition to 80 pages on world resources and trade there are three chapters concerned with principles of physical geography, whilst nearly 200 pages are devoted to the regional economic geography of each continent.

The following five books, all of Crown Quarto size, present the subject matter of economic geography in a variety of ways to suit pupils of different calibre. *A Geography of Commodities* by H. Alnwick has been a singularly useful book ever since it first appeared over twenty years ago. Now it has been revised and enlarged by H. Rees without altering unduly its style, and the second edition, 196 pp., Harrap & Co. Ltd., 1957, 15s., with its combination of text, sketch-maps and statistical tables, may be consulted with profit by fifth- and sixth-formers. Of similar dimensions is *Using the World's Wealth* by Helen G. Thomas, published by Ginn & Co. in their *Geography Second Series*, 196 pp., 1955, 12s. 6d. This attractively produced book utilizes photographs, diagrams and maps—many of the latter in several colours—to present the essentials of economic geography. Hulton Educational Publications have published three books by W. G. Moore in a series called *Essential Geography*; their respective titles, *Homes* (published 1956, 7s. 6d.), *Food* (1957, 7s. 6d.) and *Clothing* (1957, 7s. 6d.) indicate the nature of their contents. Of equal length, 127 pp., each book has over a hundred photographs, and numerous maps, diagrams and exercises. These are useful source books for pupils working independently or in groups on a project.

Amongst the new publications it is rare to find any which offer a course designed specifically for the secondary modern schools, but this is a feature

of *The Enterprise Geographies*, published by Blackie. Books 1 and 2, written by D. Smith, first appeared in 1939 (i.e. before the secondary modern schools, as such, were created) but a revised edition of book 1, 176 pp., was issued in 1953, and of book 2, 192 pp., in 1957. After the death of the original author, book 3, 208 pp., 8s. 6d., was drafted by the late Leonard Cundall and published in 1957.

The technical schools have received less attention than either modern or grammar types, and in many ways they require special consideration. It is therefore pleasing to give notice of a new book, specially compiled for technical schools, which offers a general survey of the world with more detailed treatment of the British Isles. *Geography* by J. G. C. Jackson, xii + 224 pp., Pitmans, 1956, 12s. 6d., contains in addition to the usual selection of photographs and sketch-maps, a number of clear drawings to illustrate industrial processes.

The last group comprises a number of booklets issued in 1957, with limp covers and containing 30 to 40 pages, which are really supplements to the textbook. *The People of the World* series, by the Oxford University Press, at 2s. each, provides easy reading for younger pupils on topics such as *A Visit to Zululand* or *Fur Hunting and Fur Farming*. Longmans' *Colour Geographies*, 2s. 9d. each, written by T. Herdman, with coloured photographs and maps, provide the basis for more serious study. There are twenty different units, each dealing with some special region or theme, for example Towns of Britain, Coasts of Britain, Industry in Britain, The Prairies, Great Plain of China, Mediterranean Lands, and Contrasts in Russia.

A century ago the prime function of a geography textbook was to supply the pupil—and possibly the teacher too!—with facts and statistics. The degree to which it serves this purpose nowadays will tend to vary inversely with the knowledge and resourcefulness of the individual teacher, for the subject matter of geography, if well taught, should be drawn from a wide variety of sources both inside and outside the school. For this reason the textbook need no longer be the sole or even the chief source of a pupil's information, although its value is enhanced by being accessible to all the members of a class at the same time. Today, therefore, an important function of the textbook is to suggest a *modus operandi*; it applies current theories about the aims and scope of geography in school, which are all the more valuable because often the author is an experienced teacher.

This Changing World

EDITED BY G. J. BUTLAND

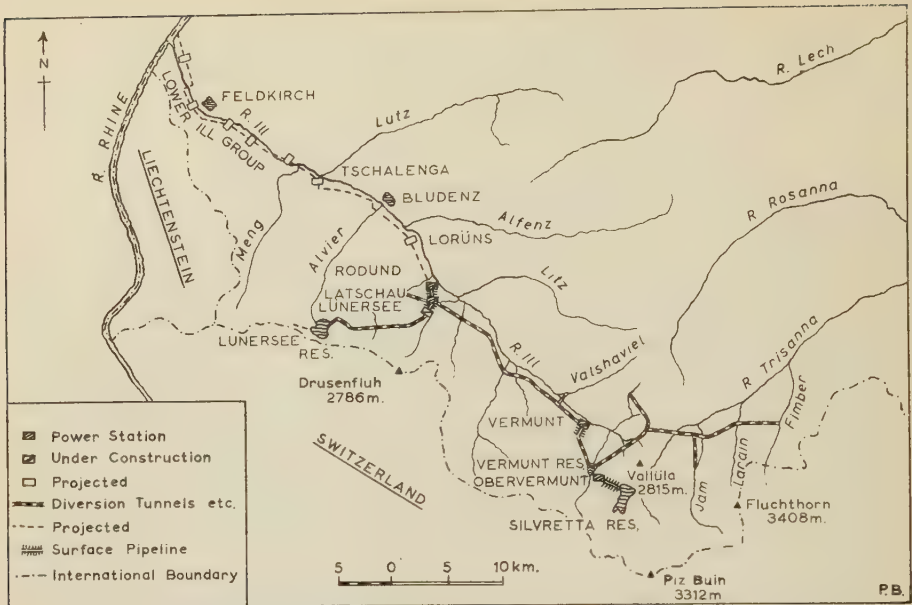
HYDRO-ELECTRIC POWER DEVELOPMENT IN THE VORARLBERG

The Vorarlberg, because of its relative nearness to the industrial centres of southern Germany, its heavy precipitation and snow-cover and the numerous glacier-fed streams along its boundary with Switzerland, early attracted attention as a possible source of hydro-electric power for export. Since the war, these advantages, reinforced by the movement towards European economic co-operation, the ever-rising power requirements of the whole continent, and Austria's own urgent need to increase both her power production for internal use and her export trade, have stimulated further development, which in part has been made possible by foreign aid. Work so far has been concentrated in the catchment-area of the river Ill, but eventually it is planned to harness the resources of the Bregenzer Ach river also.

Development in the Ill valley has been carried out by an international company, established in 1922, the *Vorarlberger Illwerke A.G.*, incorporating Austrian, Swiss and German interests. Under Governmental oversight it has control of all hydro-electric installations in the area. In 1955 the company exported more than one-half of all electric power sold abroad by Austria, earning thereby some £2 million, or 0.8 per cent by value of the country's exports of all types.

The total annual output of electricity, 38 per cent of which is produced in the six winter months, amounts to 950 million kWh, and two-thirds of this is exported to West Germany by 220 kV transmission line from the Bürs transforming station near Bludenz to Herbertingen on the Upper Danube and Brauweiler near Cologne. Although other Austrian companies sent small quantities of power as far as the Netherlands for the first time in 1955, no transmission beyond Brauweiler is envisaged for the Vorarlberg; instead a new line to Ravensburg is proposed. Power not exported is sold on a contractual basis within Austria.

The more important stages in the growth of the company's installations have been as follows. In 1931 the Vermunt power-station was opened; it is situated at Partenen near the head of the Ill valley and draws water from the Vermunt reservoir four miles upstream. In 1943 the Rodund power-station was brought into operation about 15 miles below Partenen, and 1948 saw the completion of the much more ambitious Silvretta reservoir which discharges into the Vermunt basin. Water supply to the Vermunt station was further augmented by diverting towards the Ill all streams draining into Austria from the Silvretta group, and from the somewhat lower Vallüla massif, which naturally flow eastward to the Inn system. Construction of the necessary tunnels was finished in 1953. A new power-station with associated storage basin was opened at Latschau, in a side-valley above Rodund, in 1950, and a further addition made to the plant at Rodund itself in 1951.



Hydro-electric installations and projects in the Ill valley, Vorarlberg, 1956. Based on map in *Austria's Hydro-power Resources*, Fed. Min. of Transport and Nationalized Enterprises, Vienna, 1955.

Future plans of the *Vorarlberger Illwerke A.G.* will, when fulfilled, double the company's installed capacity to some 700,000 kW, producing annually about 2,000 million kWh of power, mainly for export. This output figure approximates to 10 per cent of all the power likely to become available to foreign consumers from Austria if and when all development projects at present thought technically and economically feasible are completed.

The first stage in this planned expansion is now in hand. The level of the Lünensee, a high mountain lake south-southwest of Bludenz, is to be raised from 1,897 to 1,970 metres above sea level, thereby almost doubling its volume. The configuration of the lake basin will allow this to be done by means of a relatively small dam; each cubic metre of concrete in this dam will impound no less than 1,520 cubic metres of water. Work was begun in 1956 on the dam and associated stream diversions. A new power-station, the Lünensee, is under construction; production is expected to begin from two generators in 1958, and from a further three in 1959, when the station's full capacity of 186,000 kW will be attained. Part of this power will have to be used for pumping additional water up to the Lünensee basin, since the natural catchment is insufficient to maintain the necessary flow. The Rodund station will gain an extra 61 million kWh of peak winter power from the new reservoir. The cost of the whole development will be about £17 million, half of which is being provided from the company's existing resources, and half from internal and World Bank loans.

Besides supplying power to industrial concerns in the Vorarlberg towns, hydro-electric development in the Ill (Montafon) valley has helped to bring about a significant rise in rural living standards, mainly through stimulation of the tourist trade. Standards of accommodation have been improved and

such facilities as ski-lifts installed, in many instances out of Marshall Aid funds. Since 1953, the mountain road from Partenen to the Silvretta reservoir has been open to the public on a toll basis, and two hotels have been built at its summit.

The other major hydro-electric undertaking planned in the Vorarlberg is based upon the catchment-area of the river Ach, which enters Lake Constance near Bregenz. This river drains an area located in the lower Alps, and without glaciers; its régime therefore does not exhibit the marked restriction of winter flow characteristic of the glacier-fed Ill. Seven reservoirs and six power-stations are proposed, having a capacity of 548,000 kW and an annual output of 1,330 million kWh, 60 per cent of which will be generated during the winter months.

Saltley College, Birmingham

P. J. M. BAILEY.

RECENT TRENDS IN LAND UTILIZATION IN DENMARK

In a textbook much used in schools we read "about 75 per cent of the whole country is farmed . . . rather more than half (of this) is pasture and meadows and rather less is arable land". Since 1946 Danish efforts at intensifying the use of the land have been unrelenting and by 1957 the area of grassland of all types had declined to 33 per cent of the farmed area. The area under rotation now comprises 88 per cent of the farmed land, and of this area about 50 per cent is used for cereals, 25 per cent for grass and lucerne and 20 per cent for root crops.

CHANGES IN THE CROPPED AREAS AND IN THE NUMBERS OF LIVESTOCK
1951-1957

	In 000s Acres				In 000s			
	Grain	Roots	Grass		Cattle		Pigs	Horses
			Rotation	Permanent	Milch	Other		
1951	3,176	1,471	1,868	1,039	1,584	1,452	3,189	465
1957	3,474	1,469	1,651	901	1,446	1,722	5,438	254

During the last decade the production of wheat and rye has decreased. In contrast the spring-sown cereals have increased in yields and area in spectacular fashion, the barley area in 1956 for example being nearly 150 per cent of the 1946 area. Barley has in many areas taken the place of winter wheat in the rotation and precluded it, for wheat cannot grow well after barley which now takes up almost a half of the total grain area, there being at least two, sometimes three, fields of barley in an eight-course rotation in eastern Denmark. The national yield of barley in 1956 when compared with the 1945-49 average shows an increase of 70 per cent, whilst the other cereals have hardly managed to yield the same amounts from slightly decreased areas.

In Denmark the root crops give a large yield when compared with the other crops; in fact the feed value of the root crops in 1956 was equal to that of the cereal crops. The more productive types of roots, the fodder sugar-beets, are gradually replacing mangolds, swedes and turnips. The areas of both potato and factory sugar-beet have declined since 1950. Low prices and the lack of an adequate labour supply are partly responsible, but

the total root area is 50 per cent greater now than in 1939, a development due to farm mechanization rather than to intensification of cultivation.

Perhaps the most significant change in land use since the war is the decrease in the grass area, amounting to 70,000 acres of rotation and 250,000 acres of permanent grass, in a total farmed area of nearly eight million acres. These developments perhaps reflect the increased productivity of the remaining grasslands but the main cause of the decline may well be the reduction of the livestock, particularly horses, sheep and the dairy herd. For in contrast to the increases in crop production and the improvements in land utilization, the production of some livestock products has slackened off since 1951, special emphasis now being laid on the production of bacon and beef rather than on butter and cheese. The so-called "cattle-less farming" is becoming more popular particularly with the larger farms. The prices of meat and bacon are now relatively better, in both the British and German markets, than are the prices for dairy produce, and a greater proportion of the Danish agricultural output is being sold on the home market, for now 49 per cent of the Danish population is urban.

(The writer is indebted to Prof. K. K. Skovgaard of the Royal Agricultural College, Copenhagen, for the statistical information.)

Birkbeck College, London

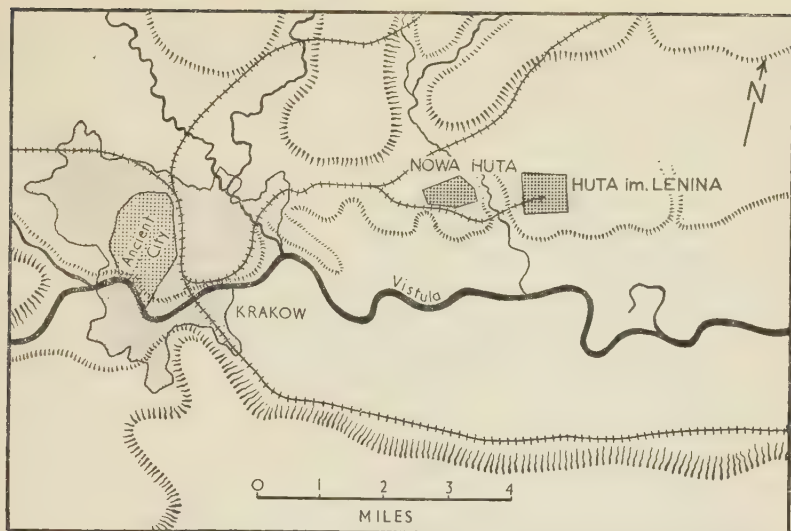
B. T. BUNTING.

NOWA HUTA: A NEW POLISH IRON AND STEEL PLANT

It was decided in 1948 that the planned development of industry in Poland would necessitate two new integrated iron and steel works. At the same time it was also agreed that the existing industrial region of Upper Silesia was already large enough and that new plants should be located outside its limits. Such a decision was reached the more readily as reserves of Upper Silesian iron ore had been worked out and much of the coking coal was expected to come from Lower Silesia or from the Ostrava-Karvina mines in Czechoslovakia.

The choice of Częstochowa for one of the new works seemed obvious. The city lies near the northern end of the Krakowska Jura, in which are found the only really significant ore deposits in modern Poland. It was a centre of iron working under the Russian Tsars, and the old Raków works are still represented by a small blast-furnace, with steel and rolling mills. The new works, the *Huta im. Bieruta*, was established in 1950 on the other side of the Warta and close to the Jurassic scarp. It has two large blast furnaces, as well as coke-ovens, open-hearth, and electric steel-works and a rolling mill. Coking coal appears to come from both the Lower and Upper Silesian fields, and ore from the nearby Jura.

More publicity and controversy have surrounded the location and buildings of the Nowa Huta. The choice of site was in no way obvious. It is said that an original list of potential sites was narrowed to three: Koźle, on the upper Oder; a site near Sandomierz, on the Wisła; and Kraków. The choice fell on the last, and it seems that accessibility to raw materials was not a determining factor, but rather the urgent need to create employment in the Kraków *Wojawództwo*, notorious for its agricultural over-population.



The site chosen lies six miles east of Kraków, and rather more than a mile to the north of the Vistula. It covers a river terrace, some eighty feet above the river. A small stream has cut a valley across the terrace, and separated the site of the city of Nowa Huta, to the west, from the *Huta im. Lenina*, to the east. The possibility of using water transport undoubtedly influenced the choice of site, although the Vistula is not yet navigable; plans have been prepared for a branch canal and dock basin, but the works must rely for a considerable time on rail transport.

The *Huta im. Lenina* was begun in the spring of 1949. It embraces within an enclosed area of about 2,500 acres, two large blast-furnaces, each of over 1,000 cubic metres capacity, with two more under construction, coke ovens, ore sintering plant, open-hearth and electric steel-works and a continuous strip rolling mill, as well as forge and press works. The present annual capacity of the works is about a million tons of steel, and this is expected to be increased to 1,500,000.

The Wałbrzych coalfield of Lower Silesia remains the chief source of coking coal, supplemented by fuel from the Zabrze area of the Upper Silesian field and, irregularly and in small quantities, from the Karwina pits in Czechoslovakia. Some adaptations appear to have been made to the furnace design to suit the requirements of Upper Silesian coke. Most of the iron-ore is brought by rail from the Ukraine. Domestic ore production has not expanded as rapidly as was planned, and, indeed, the earlier targets seem to have been quite unrealistic. Official sources now speak freely of importing more ore from the "capitalist countries". Whatever the source, the supply of iron-ore is likely to remain the most serious single problem of the Polish iron industry.

Much of the equipment of the works was supplied by the Soviet Union. Indeed, it was said that the continuous strip mill supplied to Nowa Huta was the first ever constructed by the Russians. The Poles, however, take much pride in the fact that significant parts of the work were made in the steel and engineering works of Upper Silesia.

Nowa Huta lies a half mile to the west of the gate of the *Kombinat*, and consists for the greater part of large blocks of flats, six storeys high and built of a reddish brick. The city is planned to house 100,000 people, but has at present no more than half this total. At the centre of the town is a large *Rynek*, or square, tastefully laid out with lawns, and surrounded by shops. Nowa Huta is predominantly a workers' city; many of the managerial and office staffs live in Kraków, with which Nowa Huta is linked by a frequent service of overcrowded trains.

The inspiration and, to some extent, the plans for Nowa Huta, both city and *Kombinat*, come from the Soviet Union, but it has been endowed with as much Polish character as possible. Traditional Polish styles of building have been used, and the administrative offices of the *Kombinat* are in a building in the style of the old *Ratusz* of Sandomierz.

Indiana University

N. G. J. POUNDS.

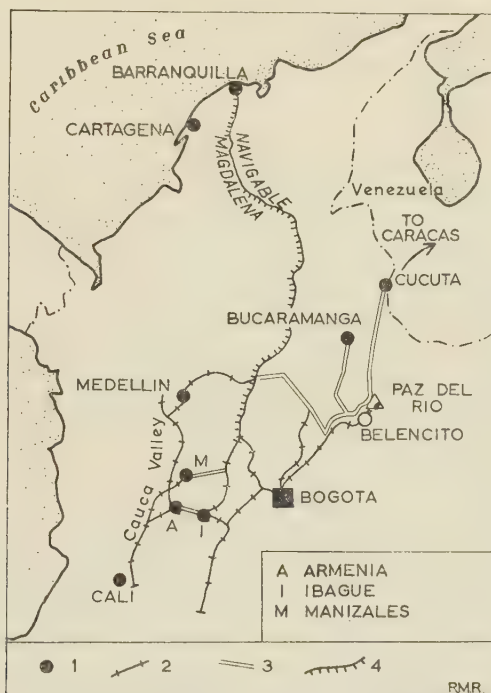
COLOMBIA'S FIRST INTEGRATED STEELWORKS

The first large iron and steel works in Colombia, *Acerías Paz del Río*, went into production in 1954. The plant is located at Belencito, 8,400 feet above sea level in a valley in the Eastern Cordillera some 120 miles to the northeast of Bogotá.

Colombia is fortunate in having more extensive probable coal reserves than the whole of the rest of Latin America, and these deposits include an appreciable proportion of coking coal. In one place only, however, at Paz del Río, is reasonably high-grade iron ore (48–50 per cent iron content) found within a few miles of a deposit of coking coal. Recent estimates put reserves at 100 million metric tons of iron ore and 1,900 million tons of coal. Belencito (near which is an outcrop of limestone) is less than 20 miles from Paz del Río, in the direction of Bogotá. Although the area is some distance from the centre of gravity of population in Colombia, it is the only one in which the raw materials could be assembled at a reasonable cost. There was therefore little doubt about the choice of site for the works, although a coastal location using imported iron ore had been suggested. It was however by no means easy to bring equipment from the coast to the site by the Magdalena and the difficult road via Tunja. Moreover, since it is very costly to transport imported goods from the coast to the interior of Colombia, it is unnecessary to introduce import tariffs to protect the new industry. The map shows the rail, road and river routes which link the works with the main urban centres of the country. Much of the urban population and most of the industrial capacity of Colombia is concentrated in the triangle Bogotá–Medellín–Cali, so the new plant is not badly situated in relation to markets.

The first iron at the Paz del Río works was produced in October 1954 and the first steel early in 1955. Production of pig iron in 1956 amounted to 116,000 metric tons with 90,000 tons of steel ingots and 72,000 tons of finished steel products. Capacity output in all these categories is set at over four times these figures. Although capacity production of steel products from the plant will exceed Colombia's 1953 imports of 330,000 tons, demand

will have increased greatly by the time production reaches this figure and the plant will therefore still not satisfy all the country's needs. At present Paz del Río is turning out structural steel, bars for reinforced concrete, rails and wire, with agricultural lime, ammonium sulphate and phosphate



Northwest Colombia, showing the Paz del Río steelworks. 1. Towns with more than 100,000 inhabitants. 2. Railways. 3. Roads. 4. Navigable Magdalena.

fertilizer as by-products. It is hoped soon to produce galvanized sheet and tinplate, and capital is being sought for further expansion. Although steel production is much less at Paz del Río than at even a moderate-sized U.S. or European steel-works the plant is of great importance to Colombia. It is a national enterprise, although foreign loans have been received, and it is largely run by Colombian technicians.

University of Nottingham

J. P. COLE.

The Geographical Association

ANNUAL REPORT 1957

It is a pleasure to record the activities of the past year. Guided by our President and old friend, Professor P. Bryan, we have enjoyed a fruitful year of consolidation and development which augurs well for the future if the current trends can be maintained.

For some years we have been able to record a steady increase in our membership. When this has been predominantly an increase in student membership it has not always been to our financial advantage, but this year has seen a substantial increase in the number of full members. Total membership at the end of the 1956-7 period was 4,366 (compare 4,109 for 1955-6) and we hope that this rate of increase will continue so that we may record a roll of 5,000 within a few years.

There are now 53 active branches; new branches have been established at Newcastle and Plymouth, and we are in communication with new Geographical Associations in Jamaica, Ghana, Nigeria and Kenya (Nairobi). Amongst branch reports there are interesting records of lecture programmes, varied branch activities, field excursions and local surveys, while a few local groups have succeeded in finding means of producing their local transactions in published form.

During the year we have held some very successful conferences and courses. To Mr. Honeybone once again credit is due for yet another outstanding annual conference organized by him with the assistance of Dr. J. H. Bird. The Spring Conference held at Matlock was very popular. In connection with these meetings, may we make a plea, however, on behalf of conference organizers, for earlier registrations and careful infilling of all details requested on the registration forms. The spate of late registrations during the past year brought difficulties.

Professor A. E. Smailes led a summer school at Aix en Provence for the second time, with an attendance of some seventy geographers, and in addition to this customary summer activity, fifty-six of our members represented the Association at the Third International Conference of Geography Teachers, held at Grenoble. To the many persons who assisted in these various courses as leaders of excursions and in other capacities, sincere thanks are extended.

The organization of such courses now involves headquarters staff in an increasing amount of work and there have been periods in the past year when our office has even taken on, temporarily, the character of a travel agency, but a real need is being met. This year, apart from attendances at the Annual Conference, nearly 400 members were actively concerned in these arrangements. We are already busy with preparations for two summer schools to be held next year (1958), one in Germany, under the leadership of Mr. T. H. Elkins, M.A., and Dr. E. M. Yates, lecturers at King's College, University of London, and one in Scotland, directed by Professor J. Wreford Watson and Professor D. L. Linton. The Spring Conference will be a rather special one in that it will be held at Aberystwyth, under the direction of Professor E. G. Bowen, and will mark the fortieth anniversary of the removal of our headquarters to Aberystwyth from Oxford. It is our hope that, in these circumstances, Professor Fleure may be able to join us and that there will be a very large attendance of members at this meeting. Difficulties regarding accommodation have made it impossible to hold one of next year's summer schools under Professor Bowen's direction at Preston Montford, as originally announced.

Our Section and Standing Committees have been active in many fields.

The *Public and Preparatory Schools Section Committee* reports record growth to a membership of 185. Plans are in progress for a conference at Cambridge next April. The possibility is being considered of instituting an annual prize for competition amongst boys in preparatory schools. A presentation was made to Dr. E. D. Laborde in appreciation of his loyal service to the section for very many years.

The *Primary Schools Section Committee* in co-operation with the Training Colleges Section has been occupied mainly with the completion of the new handbook on the Teaching of Geography in Junior Schools. It is hoped to publish this during 1958.

The *Secondary Schools Section Committee* reports a very active year. Discussions have taken place on the G.C.E. Advanced level syllabuses, on the revision and reprinting of some of the Association's publications and on the grading of geography departments under the new Burnham salary arrangements. A geography room questionnaire was sent out to all members in the spring and nearly 600 replies were received and analysed. These have given a valuable sample of the general position of schools with regard to buildings and equipment designed for our subject's special needs. The report on the survey has already been published in *Geography* and it will be widely publicized in other educational quarters.

The *Training Colleges Section Committee* has held three conferences, all well supported, which included lectures by members on geographical topics and discussions on methodological problems. The Section's research group sub-committee reports progress in its work on the reactions of the 11-15 year age group to geographical pictures.

The *Further Education Section Committee* has continued to meet, though at less frequent intervals, to discuss problems germane to its sphere of interest. The first issue of a bulletin, designed to provide topical information on geographical matters, was successfully launched. Thanks are extended to Dr. Rees of Coventry Technical College who undertook the editorial work for this. A conference was held at Bath during the spring when sixteen members of the Section attended a most instructive and enjoyable week-end, arranged by Mr. A. H. Fry (Brighton Technical College). It is hoped to hold a similar function during the coming year. Dr. H. Robinson (Huddersfield Technical College) is compiling a report on the role of geography in the field of further education.

The *Standing Committee on Urban Spheres* reports progress in the extension of the survey in the counties of southeast Scotland.

The *Standing Committee for Visual Aids in the Teaching of Geography* continued work on the selection of O.S. map extracts; this work is now in abeyance until the possibility of production is settled. Preparations are being made for displays at the Annual Conference, on topics like sources of material, filmstrip making and results of urban surveys by pupils of various ages. Work has been going on on the selection of 1957 geographical films for screening during the Conference.

The *Executive Committee of Council* has had a very busy year, concerned not only with the ever-growing volume of routine business which the advancing status of the Association inevitably brings, but also with some matters of general importance to members. For some twenty years we have been able to supply sets of Ordnance Survey map extracts specially selected for teaching purposes and many members will be aware that for many months the selection of an entirely new set of extracts has been under consideration, the original set having run out of print. We find, however, that the printing costs of the new extracts would be so high as to price the sets outside school resources. A final decision in regard to this matter has yet to be made, but it seems likely that the provision of maps sets as before will have to be discontinued.

Part of our dilemma is due to the small amount of money made available for the purchase of books and equipment in schools, and, jointly with six other bodies, this Association has addressed a letter to the Association of Education Committees deploring the present state of affairs and urging members of that association to devote a larger amount of their educational expenditure to the provision of school books and teaching materials.

An important step taken by the Executive Committee was the submission of a memorandum, on the place of geography in the education of boys and girls aged 15 to 18 years, to the Central Advisory Council of the Ministry of Education. The content of this memorandum was recorded in part 2 of *Geography*, vol. xlii, 1957.

In the *Library*, further progress has been made, under the direction of Mr. L. J. Jay, in the preparation and publication of sections of the new library catalogue. New card catalogues are gradually being built up to improve reference facilities, for example, a complete author catalogue, and classified geographical article reference cards, abstracted from periodicals received. Many new school textbooks have been sent by publishers for review or for display and branch members of the Association and others visiting Sheffield have been able to examine displays of new books. The collection of early textbooks has already proved to be of value and interest to students of the development of the teaching of geography.

Changes in accounting procedures generally have called for a review of our own internal procedure with regard to the issue of receipts. Acting on the advice of our accountants, we shall not in future issue receipts for payments except where these are made in cash and except where they are specifically requested, thereby effecting a very considerable saving in labour and postage charges. But it should be clearly understood that receipts will be issued for any amounts, large or small, for subscriptions or otherwise, if a member requires these and makes application, enclosing a stamped envelope, at the time of making payments.

Pending the completion of a test case regarding subscriptions paid under deeds of covenant, the refund of Income Tax payments by the Inland Revenue Department is at present in abeyance. We are, however, still negotiating with H.M. Inspector of Taxes and hope that there may be a successful issue in these proceedings. For this reason we urge members to continue to subscribe payments under covenant, though, as our Balance Sheets show, we have not greatly benefited from this source for two years.

To our Honorary Auditor, Mr. W. R. A. Ellis, a special word of thanks is due for his watchful care of our financial affairs, and his report is published independently of this annual report. Your Honorary Secretary takes this opportunity, however, of drawing attention to the improved financial position made possible in no small degree by stringent economy at headquarters. The anxieties expressed in the Annual Report of a year ago have, at least temporarily, been alleviated, though there is much leeway still to be made up in the provision of proper salaries and wages scales, office equipment and better working conditions for our very loyal staff. It must be our constant endeavour to be good employers, though this in present circumstances involves heavy charges on our resources.

This report cannot be concluded without reference to the fine work of Professor Linton, Honorary Editor, and our editorial board in maintaining the outstanding high quality of our journal *Geography*. We welcome especially the continuance of "This Changing World" under the editorship of Dr. G. J. Butland.

To our retiring President and members of Council and of executive committee we extend sincere thanks for the numerous services they have rendered.

Despite the rigours of this age of inflation that can overnight sabotage the best of endeavours, we seem, during a difficult year, more than to have held our ground. We call therefore for renewed and vigorous help, as the tide seems now to be turning

in our favour. Our work for the subject and its teaching can thrive only as the Association continues to grow from strength to strength through members' individual and collective support.

ALICE GARNETT
Honorary Secretary

December 1957

FINANCIAL REPORT 1956-7

The Income and Expenditure Account is the best indicator of the Association's health, and the perusal of the Account for the year ended 31st August 1957 reveals a credit balance of £595, to be compared with the deficit of the previous year of £114; this change has come about by an increased net income of £383 and a reduction in net expenditure of £326. A most encouraging feature on the income side is the increased contribution from subscriptions, a tribute to the work of branches and to the efficacy of expenditure on publicity in 1956. The Commissioners of Inland Revenue, however, have withheld the refund of Income Tax on Covenanted subscriptions since 1955-6, pending decisions in an approaching test case. New advertisement rates and the diligent sale of publications by headquarters have increased revenue from these sources.

The welcome stabilization of printing costs, which have been slightly lowered this year, smaller stationery purchases, and reductions in salaries caused by staff changes have been principal items in reducing expenditure, although many smaller economies have been effected by headquarters staff.

On the Balance Sheet, the much improved state of the Accumulated Fund and the General Reserve may be noted. These are almost doubled by the contribution from the new Study Courses and Conferences Account; this growing side of headquarters activities is giving members first-class educational tuition and travel at rates far below those commercially possible. The success of the Association's courses and conferences is based on many factors, including the generosity of leaders, the sympathy of colleges and universities, and the very hard work carried on by the Honorary Secretary and the staff at headquarters.

With the exhaustion of the stock of O.S. map extract sets, the Miscellaneous Maps Account will be closed after this year.

Concerning assets, the policy of re-investment during the past two years has borne good fruits but there is no room for complacency and the Finance Sub-Committee is considering and implementing ways of improving investments in the light of current interest rates.

Against this encouraging background it has been found possible to give the long-promised aid to Branches by the payment of 1s. per full member, during 1957-8, supplementary to the statutory subvention which can be claimed.

In the current financial year the Association will be faced with increased postal and telephone charges, salary increments, much-needed purchases of office and library equipment and increased grants to Section and Standing Committees. To meet these costs, headquarters will reduce expenditure to the lowest level compatible with efficiency and the Association will seek to increase its strength, while spreading its amenities, through membership recruiting drives conducted by branches and individual members.

W. R. A. ELLIS
Honorary Auditor

November 1957

THE GEOGRAPHICAL ASSOCIATION

Dr.

MISCELLANEOUS MAPS ACCOUNT—INCOME AND EXPENDITURE ACCOUNT for the year ended 31st August, 1957

Cr.

	1956			1956			1956		
	£	s.	d.	£	s.	d.	£	s.	d.
To Stock at 1st September, 1956	..	..	..	..	..	..	..	..	..
" Maps Purchased	..	..	..	..	..	..	..	..	..
" Depreciation of Duplicator	..	..	..	..	..	..	..	..	..
" Balance, being Excess of Income over Expenditure transferred to the Publications Reserve Fund	..	..	..	..	..	..	..	..	..
	171	17	3	157					
	£272 5 8			£324			£272 5 8		

THE GEOGRAPHICAL ASSOCIATION

BALANCE SHEET

31st August, 1957

		£	s.	d.	£	s.	d.	1956 £
ACCUMULATED FUND								
Balance as at 31st August, 1956	..	85	16	5				200
Add Surplus for the year as per Income and Expenditure Account	..	594	19	11				(Deficit) 114
					680	16	4	86
GENERAL RESERVE								
Add Balance from Study Courses and Conferences Account	..	690	11	6				
		640	10	3	1,331	1	9	691
					498	7	4	209
SUBSCRIPTIONS PAID IN ADVANCE								
SUNDRY CREDITORS	..							
Geography Issue	..	460	12	5				959
Superannuation	..	—	—	—				2
Summer School	..	96	9	6				100
Sundry	..	293	5	8				485
					850	7	7	2,446

		£	s.	d.	£	s.	d.	1956 £
ACCUMULATED FUND ASSETS								
DEBTORS	..							
Summer School Account	..	290	19	0				87
Sundry	..	444	1	3				291
					735	0	3	378
					359	10	1	246
Stock of Special Publications								
OFFICE AND LIBRARY FURNITURE AND EQUIPMENT								
Estimated Value, 31st August, 1951	..	150	0	0				
Additions since	..	351	3	0				
		501	3	0				
Less Depreciation to date	..	181	3	0				
		320	0	0				357
INVESTMENTS								
£200 3% Savings Bonds 1965/75 at par	..							
(Approximate Market Value, 31st August, 1957, £140)					200	0	0	200
Cave Austin & Co. Ltd.—1,265 5% Cumulative Preference Shares of £1 each, at cost								
Cash in Hand	..	23	3	4				
Cash at Building Society	..	1,009	1	0				
		1,032	4	4				
		137	14	8				
Less Cash at Bank overdrawn					894	9	8	1,161
					3,360	13	0	2,532
PUBLICATIONS RESERVE FUND ASSETS								
Duplicator, at cost	..	32	3	2				
Less Depreciation	..	20	5	1				
					11	18	1	14
Stock—Map Sets	..							
Sundry Debtors	..							
Cash at Building Society	..	949	0	2				
Cash at Bank	..	665	14	7				
					1,614	14	9	1,346
					1,635	19	11	1,432
Carried forward								
					4,996	12	11	3,964

Brought forward

LIFE MEMBERSHIP SUBSCRIPTION FUND

Balance as at 31st August, 1956

Add Subscriptions received during the year

£	s.	d.	£	s.	d.
4,996	12	11	4,996	12	11

1956	£
3,964	£

Brought forward

LIFE MEMBERSHIP SUBSCRIPTION FUND

ASSETS

Investments

£1,646 4s. 2d. 3% Savings Bonds

1955/75

£300 3% Savings Bonds 1955/65

300 0 0

£170 3½% Defence Bonds (Conversion

Issue 1964)

(Approximate Market Value, 31st August,

1957, £1,584)

Cave Austin & Co. Ltd.—985 5% Cumulative

Preference Shares of £1 each, at cost

Cash at Building Society

Cash at Bank

£	s.	d.	£	s.	d.
4,996	12	11	4,996	12	11

1956	£
3,964	£

Brought forward

JUBILEE FUND ASSETS

Investment, at par

£820 3% Savings Bonds 1965/75

(Approximate Market Value, 31st August,

1957, £574)

Cash at Building Society

Cash at Bank

£	s.	d.	£	s.	d.
820	0	0	820	0	0

820	£
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Brought forward

HERBERTSON MEMORIAL FUND ASSETS

Investment, at par

£250 3% Savings Bonds 1965/75

(Approximate Market Value, 31st August,

1957, £175)

Cash at Building Society

Less Cash at Bank overdrawn

£	s.	d.	£	s.	d.
3,009	18	8	3,009	18	8

2,954	£
56	£

£	s.	d.	£	s.	d.
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PRESIDENTS, 1958 AND 1959

We welcome Professor R. O. Buchanan as President for 1958 in succession to Professor P. W. Bryan. At its meeting on 31st December, 1957, Council elected Professor J. A. Steers of the University of Cambridge as President-elect for 1959.

ELECTIONS TO COUNCIL

At the Annual General Meeting of 2nd January, 1958, the following members were elected to fill vacancies on Council: Mr. D. J. Davis (Birmingham Branch), Professor K. C. Edwards (University of Nottingham), Miss E. Gilmore (Westminster and Central London Branch) and Mr. A. H. Fry (Brighton Branch). Professor Edwards and Mr. W. C. Chapman (already a member of Council) were elected to serve on the Executive Committee.

CONGRATULATIONS

Warm congratulations are offered to the Honorary Treasurer, Professor L. Dudley Stamp, immediate Past President of the International Geographical Union, and to Professor Hans Ahlmann, President of the International Geographical Union, on the award to them in September, 1957, of Medals of the Tokyo Geographical Society. These Medals are awarded periodically for services to the advancement of geography with special reference to Asia in general and Japan in particular.

ANNUAL CONFERENCE, 31ST DECEMBER 1957 TO 3RD JANUARY 1958

The Annual Conference was notable this year for the large attendances at all of the lectures, over 500 persons packing lecture theatres in both buildings at the London School of Economics. The theme of the conference was Urban Study. The general problem was discussed, in a lecture jointly to the Royal Geographical Society, the Institute of British Geographers and the Geographical Association, given by Professor A. E. Smailes at the House of the Royal Geographical Society; and other aspects were the changing industrial landscape, by Professor S. H. Beaver; the factor of atmospheric pollution in urban studies, by Dr. Alice Garnett; English seaside towns, by Professor E. W. Gilbert; railway geography in urban areas, by Mr. G. F. A. Wilmot; and the evolution of an English country town (Saffron Walden) by Mrs. D. Monteith. A well-planned series of excursions was related to several of the urban topics. In other fields Mr. W. V. Lewis gave a lecture on recent theories of glacial erosion, and pedagogical matters related to our subject were considered in discussions on geography at the Ordinary Level of G.C.E., led by Mr. G. Bruce and Mr. J. C. Larkinson, under the chairmanship of Mr. J. G. Rushby; in a demonstration lesson given by Miss P. M. Jeffery, with girls from Mayfield School, Putney; and in a meeting sponsored by the Training College Section where Mrs. I. M. Long summarized the investigation into the interpretation by school children of geographical pictures. The President gave an address on Landscape and Geography noteworthy not only for its content but also for the superb illustrations that accompanied it.

The Annual Dinner, which is becoming increasingly an occasion of reunion for members of the Association's Summer Schools, was attended by over 100 members. Amongst our guests we welcomed Dr. Hilda Ormsby, a very old friend of the Association.

To the Officers of the London School of Economics and to the Council of the Royal Geographical Society once again we express our gratitude for the very generous hospitality afforded us for our meetings. To our indefatigable and unfailingly cheerful Conference Organizer, Mr. R. C. Honeybone, and to his able assistant, Dr. J. H. Bird, we extend in very special measure our sincere thanks for the organization of a most successful conference.

SPRING CONFERENCE 1958

The Spring Conference will be held at Aberystwyth under the direction of Professor E. G. Bowen from 8th to 12th April. There has already been a good response to the circulation of programmes and application forms to all members. Any member who wishes to attend but has not so far registered should write without delay to the Conference Organizer, Miss M. Oughton, Geographical Association, c/o The Park Branch Library, Duke Street, Sheffield 2, from whom copies of the programme can be obtained.

SPRING CONFERENCE 1959

It is proposed to hold the Spring Conference in 1959 from 31st March to 4th April at Leicester. The programme will be arranged by Professor Norman Pye, University of Leicester, and the Leicester Branch of the Association.

SUMMER SCHOOLS 1958

Arrangements are going ahead for the Summer Schools in Germany and Scotland in July and August 1958. A few applications for men's places on the courses may still be considered if submitted at an early date.

INTERNATIONAL GEOGRAPHICAL WEEK

Detailed announcements are awaited about the International Geographical Week to be organized by the Belgian Fédération des Géographes from 4th to 11th August in Brussels. Members who are interested in attending this international meeting of geography teachers and who have not already advised headquarters of this should write as soon as possible to the Assistant Secretary who will forward their names to the Belgian organizing secretary.

ANNUAL CONFERENCE 1959

The Annual Conference will be held in London from Tuesday 30th December 1958 to Friday 2nd January 1959. Residential facilities will be available at Campbell Hall. The programme will be circulated to members without application in November 1958.

STANDING COMMITTEE FOR THE *Geographer's Reference Book*

A new Standing Committee of the Association has been formed, under the chairmanship of Dr. M. J. Wise, to explore the possibility of periodic publication of *A Geographer's Reference Book* on the lines of the first edition published in 1955 by the independent Geographical Handbook Committee under the Chairmanship of Mr. C. H. Saxelby.

FIELD WORK CENTRES FOR SCHOOLS

There has already been an encouraging response to the questionnaire recently circulated to members inviting their recommendations and advice on field centres suitable for geographical school work; but the return of many more completed questionnaires would greatly increase the value of the record that could be compiled from the shared experience of members. Further copies of the questionnaire leaflet can be supplied from headquarters immediately on application. Any member who has available information and recommendations on field work centres or camps is urged to complete the form and send it to headquarters as soon as possible.

REGIONAL BIBLIOGRAPHY OF THE BRITISH ISLES

During January, members were invited to assist in the compilation of a regional bibliography of geographical references which would be of the greatest value in



O. U. P.

BACKGROUND READING

Arctic Whaling Adventures

BY MICHAEL HYDE

136 pages with 37 illustrations by EDWARD OSMOND

School Edition. Paper boards, 6s. **General Edition.** Cloth boards with jacket, 7s. 6d. net

Factual accounts and stories of whales and whaling, for children of 10-14.

The Thames flows down

BY LAURIE OSMOND

82 pages with illustrations in colour by EDWARD OSMOND.

15s. net

A companion volume to *A VALLEY GROWS UP* presenting a vivid picture of the great river, the interaction of men and natural forces upon it from earliest times to the present day, and the multitudinous aspects of the present scene.

Great Explorers

BY NORMAN WYMER

260 pages with half-tones.

8s. 6d. net

The lives covered are : Christopher Columbus ; Ferdinand Magellan ; James Cook ; Alexander Mackenzie ; John Franklin ; David Livingstone ; Captain Scott ; Sir John Hunt.

Also available in eight booklets, limp cloth, each 1s. 9d.

Tom-toms in Kotokro

BY RENÉ GUILLOT *Translated by Brian Rhys*

196 pages with line drawings by A. DOUTHWAITE.

9s. 6d. net

This book is more than an exciting adventure story, for René Guillot has brought to it his unique gift of evoking the spirit of the African jungle, and the book provides a fascinating insight into the customs and beliefs of the tribesmen who live there.

*There are many other such books to be found in the
Library catalogues (Junior and Secondary) of the*

OXFORD UNIVERSITY PRESS
EDUCATION DEPARTMENT OXFORD

An Introduction to Advanced Geography

E. W. H. BRIAULT, M.A., PH.D., and J. H. HUBBARD, B.A.

This is a consecutive course covering the whole field of general geography and falls into the following main sections: Maps: the geographical tools; The Surface of the Earth; The Atmosphere; The Living Environment; The Livelihood of Man; Man in Society; The Geographical Point of View. The book sets out to give sufficient information on the many aspects of general geography to meet the needs of the G.C.E. Advanced Level and to act as an introduction and guide to further reading and study. It also meets the needs of training colleges and university students.

24s. net.

GEOGRAPHIES FOR ADVANCED STUDY

Edited by Professor S. H. Beaver, M.A., F.R.G.S.

The Scandinavian World

ANDREW C. O'DELL, M.SC., F.R.S.E.

In Scandinavia, with its northerly latitudes and glaciated landscapes, there is a strong interest in how man has developed the land and in some of the countries created a high standard of living. The geographical factors leading to this have been examined and the basis of the economy of each country has been considered in turn. The volume is well illustrated by maps and diagrams and by photographs, many of which have been taken by the author. The volume is divided into three parts: Part 1, Physical and Historical Introduction; Part 2, Regional Geography; Part 3, Economic Geography.

45s. net

West Africa

R. J. HARRISON CHURCH, B.SC. (ECON.), PH.D.

This is the first detailed study of West Africa in any language. For many years the author has made a specialised study of the area and has travelled some 20,000 miles in long tours in British, French and Spanish territories. His book is the result of wide reading in several languages, of much field work, and of checking by many international experts with whom the author has worked or been in contact.

Part One deals with the natural conditions in West Africa and with some of the human problems which these present.

Part Two analyses man's work in agriculture, livestock holding, mining and the provision of transport, as well as the distribution of man himself.

Part Three is an examination of the individual countries, after a general review of their contrasted character and situation. The regional approach has been adopted in most chapters.

One hundred maps and more than that number of photographs have been most carefully chosen to complement the text.

45s. net

L O N G M A N S

THE LAND FROM THE AIR

A Photographic Geography

G. DURY, M.A., Ph.D.

Birkbeck College, University of London

and J. A. MORRIS, B.Sc. (Econ.)

Latymer School, Edmonton

Photographs, like maps, need to be interpreted as well as read. This book aims to assist both the reading and the interpretation of geographical photographs taken from the air. It is intended also to show something of the possibilities and the limitations of such photographs, and to illustrate a wide range of topics and types of country.

The selection of photographs is all of the British Isles; the first five pictures relate mainly to physical features; next come six examples of settlements treated chiefly with respect to their siting, and here historical information has to be introduced; five views ranging from the Scottish Highlands to Kent illustrate land use in relation to the physical setting; and the last four photographs deal with industrial topics. Many line figures, including charts, plans and maps, are included as a guide and comparison to the reading of the photographs and, also, the Ordnance Survey map.

The text of this book covers the syllabus of the London and similar 'O' level G.C.E. papers.

10 × 7½ inches, 104 pages, fully illustrated.

Just published

8s. 6d.

GEORGE G. HARRAP & CO. LTD

182 HIGH HOLBORN, LONDON, W.C.1

JUST PUBLISHED

THE STUDENT'S OUTLINE ATLAS OF THE BRITISH ISLES

This valuable book of outline and outline relief maps has been designed for use in either Geography or History classes. A generous number of maps, including many of local regions, make up the book together with pages of graph paper which may be used for diagrams and the plotting statistics of climate, trade, population, etc.

*Size 10¼ × 8½ in. 27 Outline Maps. 11 Relief Outline
8 Pages Graph Paper. Printed Manilla. 3s.*

THE HOUSE OF GRANT LTD

91-93 Union Street, Glasgow C.1

local studies. The Library is grateful to those who have promptly submitted reference information. It is hoped that many other members will yet send local reading lists or references to local sources. The submission of lists by 31st May 1958 would be of great assistance in the revision of the bibliography of *Local Studies*.

SPECIAL PUBLICATIONS

The following publications are out of print and copies cannot be supplied from headquarters: *Local Studies*; *Geography in the Primary School*; *Lincolnshire Studies* (reprint); set of 6 O.S. map extracts and geological transparencies. Reference copies of *Local Studies* and *Geography in the Primary School* can be borrowed by members from the Association's library.

Adequate supplies of *Asia* and *Africa* sections of the library catalogue are available (2s. 6d. and 2s. each respectively, to members). Leaflets on the classification of the library and listing the names and length of runs of geographical periodicals received and held in the Library can be obtained on application to headquarters enclosing 3d. in stamps.

AIR PHOTO MOSAICS

In the January Publication Report of the Ordnance Survey it is announced that a limited number of 6-inch air photo mosaics are now available for sale at 12s. 8d. each, chiefly for southeast England but also for other small areas. Inquiries, indicating the area of interest, should be addressed to the Director General (Map Sales Branch), Ordnance Survey Office, Chessington, Surrey.

Reviews of Books

With very rare exceptions, books reviewed in this journal may be borrowed from the Library by full members or student library members of the Association.

Rural Depopulation in England and Wales 1851-1951. John Saville. 13.7 × 22 cm. xvi + 253 pp. London: Routledge and Kegan Paul. 1957. 28s.

Sponsored by the Dartington Hall Trust, this well-written, carefully documented and moderately priced book presents a sociological study of the causes and effects of rural depopulation in England and Wales during the last century. Many geographers have already written on this subject, and the author shows a close acquaintance with the relevant literature. Commencing with an historical analysis of the various factors that have reduced the opportunities for employment in the countryside compared with the town, the book proceeds to examine some of the striking changes in the settlement pattern, as well as in the age and sex structure of the population, that have resulted from persistent migration between rural and urban areas. Not only has the movement to the town been especially strong in age groups below forty, but, in general, it has been greater amongst women than men. The problem of rural depopulation admits of no simple solution, but the author believes that much could be achieved by a national policy directed to the deliberate re-invigoration of both the economic and social life of rural areas. The latter part of the book is devoted to an interesting case study of the problem of rural depopulation in a group of eighteen Devonshire parishes, forming part of the fertile district of the South Hams. A simple map of this area is included, and numerous graphs and tables provide useful demographic data for England and Wales in general and for Rutland, Warwickshire and the South Hams in particular.

H. T.

Wales from the Air. G. Melvyn Howe. 24 × 19.5 cm. xi + 43 pp. Cardiff: University of Wales Press. 1957. 15s.

After a brief introduction on the geography of Wales, there are 42 plates of oblique aerial photographs each accompanied by an explanation. The physical landscape is illustrated in the first half of the book, cultural landscape in the second. The reproduction is very good and the text is informative if brief. A location map to the illustrations facilitates O.S. map reference. The diversity of the Welsh landscape provides a good range of features of different kinds—coastal, glaciation, settlement and land use. The University of Wales Press is to be congratulated on its production of this book which, for schools, may be regarded as a companion volume to Margaret Davies' *Wales in Maps*. School and college libraries should have it for use in studies of Wales or of Highland Britain, and for map-reading exercises. M. O.

Kuwait and her Neighbours. H. R. P. Dickson. 16 × 23.5 cm. 627 pp. London: George Allen and Unwin Ltd. 1956. 75s.

This finely produced and substantial book follows Colonel Dickson's *The Arab of the Desert*, and reveals again his great knowledge and sympathetic understanding of the Arab and his customs. The work is divided into four parts, headed respectively "Mainly Descriptive", "Mainly Historical", "Mainly Reminiscent", and "Supplementary". The last part (which is all too short) discusses Kuwait 1950-3 and her growing status as an oil producer and the principal supplier of Britain's crude oil.

The author is more concerned with persons and events than with places, and in a broad sweep outlines the history of the major Arab tribes in Arabia and Iraq, fitting the Shaikhdom of Kuwait into the broad pattern. His experiences and adventures as a young political officer in the area during and after the first World War, and his personal friendship with the late King Ibn Sa'ud make all the more readable his account of the most recent period of Arabian history. At the back of the book is a useful glossary of Arabic terms and a series of maps of Kuwait, Basra and district, and genealogical tables.

Fascinating as it is, the book justifies a place only in the richest of school geography libraries, but it will be of some value to the specialist in University Departments of History and Geography. A. B. M.

Regional Planning and Development. A. Glikson. 15 × 24 cm. 120 pp. Leiden: A. W. Sijthoff. 1955. Dutch fl. 8.

The six lectures printed in this volume form a philosophical treatise on the aims of regional planning, illustrated principally by reference to recent developments in Israel and the Netherlands, but also to the work of many well-known authorities on the subject. One lecture pays special attention to geography and planning, but the author's consciousness of the importance of geographical perspective is apparent throughout the volume. It is all the more unfortunate that some terms are misused (e.g. watershed for drainage basin) and that many simple ideas are wrapped in obscure language. Thus the aim of regional planning is not only "the achievement of orderly relations between man and nature" but also "the realization of nature as a unity of temporal-spatial dimensions and integral cycles." Such defects may however be overlooked in a work which sheds new and unfamiliar light on regional problems. A. J. H.

Types of Rural Economy. Studies in World Agriculture. René Dumont. Trans. by D. Magnin. 14 × 22 cm. xii + 556 pp. London: Methuen and Co. Ltd. 1957. 45s.

This book, of which the original French edition was published in 1954, now appears in a competent English version, if one excepts the curiously stilted style of the preface. It is not the work of a geographer but it provides a series of case studies

of farms, in Europe and its borderlands, and three chapters on tropical areas. Professor Dumont, who has an eye for cultural landscape, uses his wide experience to make many critical comparisons of agricultural policy and practice in the different countries; he integrates what he has to say about agriculture with some discussion of each country's general economic situation. His book should be of considerable interest to the student of geography both as illustrative documentation and as providing starting points for discussion.

The author is particularly conscious of the demographic factor and its social repercussions. He is an outspoken opponent of schemes for the encouragement of small holdings, especially of those that expend the limited available capital on stone and concrete rather than soil improvement, equipment and research. His test of any system of tenure is its productivity. Large fields and farms are required to derive full benefit from specialized mechanization. Co-operation in itself is not enough. He appears to have an unsullied faith in the capacity of planned economy (in which "the office replaces the market") to meet "real" as distinct from "economic" needs and he would seem to prefer rapid collectivization, though he admits the dangers of incompetent administration. He is a severe critic of Malthusianism, in the sense in which the term is frequently used by French writers for restrictions of any kind of production. On the other hand he makes several unfavourable references to over-production, in his own country, of wheat, wine and sugar-beet, all crops to which protection has been given, while inadequate attention, he considers, has been given to research. The maps are of a rather low standard. In the text it might have been more convenient if the original hectares had not been converted into acres.

C. J. R.

The Study of the Soil in the Field. G. R. Clarke. 4th edition. 14 × 22 cm. 204 pp. Oxford: Clarendon Press. 1957. 35s.

This fourth edition of a work published originally in 1936 is much rewritten and has an additional section on the use of air photographs in soil survey. The original subject matter is grouped into five sections: soil site, soil profile, soil sampling, soil mapping and the description of various soil survey systems.

The section on soil sampling is concerned with the description of simple field practices, e.g. obtaining a monolith. The second section, after giving instructions for digging a profile pit, is devoted to the method of describing a soil *in situ*, embracing such themes as horizon development, water conditions and soil aggregates. No insuperable difficulties would be encountered in following this practical method, and no great knowledge of chemistry is required. Nevertheless, although it is widely recognized that soil studies could form a useful link between physical and human geography, and although the theory of soil classification is quite widely taught, unhappily for our subject few geographers receive training in soil studies in the field; unhappily because the sections in this book on site and on mapping reveal just how much a geographer, trained in the field, could bring to the study of soils, for they are concerned with methods of recognizing within the landscape the factors of slope, aspect, drainage, geology and utilization. This type of landscape analysis is not simple geomorphology for it requires also a recognition of the effects of human occupancy and development, and of simple vegetational grouping; but assuredly it is geography at its best.

In soil studies there is thus a wonderful opportunity that geographers have yet to seize. That this opportunity exists is further exemplified in the final section, on national survey systems. In the official British system (that is, of the Soil Survey) with an emphasis on the soil series, even the geological patterns of the country tend to be obscured and the resulting map is not of great geographical interest. In the Scottish system this loss is in large measure avoided by grouping the soil series developed on one parent geological formation into the association, but the Russian system is landscape survey, similar to the regional survey in this country (as originally

described by R. Bourne and commented upon by D. L. Linton in *London Essays*, 1951) and commencing with the "natural region". What is this if it is not practical applied geography? This is at once a most useful book and a challenge.

E. M. Y.

Location and Space-Economy. W. Isard. 15 × 23.5 cm. xix + 350 pp. London: Chapman and Hall. 1956. 70s.

In this advanced work on the location of economic activity the geographer's interest will be attracted mainly by the emphasis on the spatial elements in location. At least two major groups of economic factors are suggested as ordering society in a spatial framework; the inequality of resource endowment between areas and the various forces making for dispersal of economic activity, especially diminishing returns. The complex system of space relations which results is a fundamental part of economic life demanding an analysis no less penetrating than that given to other aspects of economics. Hitherto economists have placed the emphasis elsewhere. Considerations of space in economic location theory are here worked out at length in chapters on transport inputs, market and supply areas and trade theory. Other elements are not so fully covered, labour orientation, for example, being dismissed in a few paragraphs and the only direct discussion of labour issues occurring as a footnote. The author's "general theory" evolves naturally out of his eclectic approach and embraces within a dynamic framework "the total spatial array of economic activities . . . , their inter-relations both aggregatively and atomistically . . . , the geographic distribution of inputs and outputs and . . . variations over space in prices and costs."

The proliferation of footnotes (over 400) is a major irritant to the reader. Some of these, of considerable length and containing important argument, would have gained from incorporation into the text. This book will be of little value to the general reader or undergraduate student of economic geography, but it will be a significant contribution for the postgraduate specialist. Stimulating though it is, the general theory expounded is of little general utility, for it deals with equilibrium conditions which are never attained in reality. Geographers will await with interest the second volume in which the theory will be exemplified in its regional context.

R. C. E.

An Introduction to Advanced Geography. E. W. H. Briault and J. H. Hubbard. 14.5 × 22 cm. xi + 470 pp. London: Longmans, Green and Co. 1957. 24s.

In preparing a new book essentially for sixth form use, the authors have used a method which reflects their own work at this level and which should illuminate for many others the real joy and value of teaching geography to pupils striving for maturity of thought. They offer critical appraisal of theories and research and enjoin the reader to make further studies for himself. For the sixth form pupil this systematic guide will supplement the vision of his live teacher and help him to formulate his ideas on geography as an advanced study and a discipline.

The outline of general geography is discussed in six sections: maps, the geographer's tools; the surface of the earth, which includes studies of specific British land-form examples; the atmosphere, including a useful exposition of air mass theory and some clever illustrations; the living environment—a survey of vegetation, soils and zoogeographical regions; the livelihood of man, which traces the operative factors in the development of economic geographic differences and does not attempt a comprehensive account of individual activities; and man in society—chapters on the factors affecting settlement, urban development and population distribution and growth. Particularly noteworthy are studies of land-form examples which suggest methods and criteria for local studies; the combination of photographs of British scenery with the relevant triangle of the O.S. map from the viewpoint and the unconventional

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orientation of some of the maps are instructive as book illustrations. The development of geographical ideas and the geographical point of view are the subjects respectively of the introduction and the conclusion.

The style of the book is not what the first-year university student would expect, but many would profit by appreciating the attitude of the authors to their subject. Schools with active sixth forms would do well to invest in sufficient copies for frequent library use, and the private student, working often without tutors, would find the book an admirable stimulus and guide. But all will need to consult the standard references mentioned in the very adequate chapter bibliographies to find the body of general geography, for this is in fact an excellent systematic introduction and not a textbook.

M. O.

Geography in Schools. Grace A. Wood. 12.5 × 19 cm. 181 pp. London: Blackie and Co. 1957. 9s. 6d.

This stimulating book, the latest addition to Blackie's series "The Technique of Teaching", is full of practical hints. Few teachers could fail to derive benefit from reading it, though they may frequently disagree with the author's point of view. More than half of the book is devoted to primary school work and suggests methods of introducing geographical ideas to young children. The concluding sections are addressed to the secondary modern school non-specialist, the general practitioner whose subjects are determined by the exigencies of the time-table. The emphasis throughout is rightly put on work done by the pupil; the teacher's job is to prepare the ground and to provide the facilities with which the individuals and groups work.

The author may have over-simplified some of the problems. Projects and sample studies can be well done only by good and experienced teachers who have no difficulties with class control and whose store of geographical knowledge is sufficient to enable them to select the right subjects and to prepare them adequately. It is a simple matter to draw up a syllabus with topics like "Year 3: The Geography of Settlement, treated historically; River Valley Phase, Mediterranean Phase, Atlantic Phase, the Air Age". It is a fallacy to imagine that the young beginner knows how to prepare these topics for a class of thirteen-year-olds.

J. A. M.

Empire Information Project. 45.5 × 62.5 cm. 43 charts. Wakefield: Educational Productions Ltd. 1956. 42s.

A loose-leaf binder holds 43 information sheets and wall charts on parts of the Commonwealth, the coloured charts being in the customary style of Educational Productions Ltd.—maps, pictures and letterpress information in bold colours and outline. While the folder could be used as a kind of picture atlas of the Commonwealth, the sheets will probably be most useful as wall charts in secondary modern schools or with advanced junior classes. The sheets for less well-known parts of the

The Le Play Society

FIELD STUDIES, 1958

Easter Vacation. Morocco, April 9th to 24th. Travel by air to Tangier. Through the Rif to Fez, Beni-Meljal, Marrakesh; and a visit to the High Atlas, etc. Leaders; Mr. A. McKie Frood, M.A., and Miss Margaret Tatton.

Keele. University College, with its modern accommodation as the centre. Rural studies on Staffs. moorlands, and Urban studies in the Potteries and Tileries, with Professor S. H. Beaver, M.A., Mrs. Beaver and others associated with the College. March 26th to April 3rd.

Summer. Dürnstein on the Danube, Austria, and a weekend in Vienna. Route via Ostend and the Danube from Linz. Leaders: Mr. G. North, M.A., and Miss E. Benten, M.A. July 30th to August 14th.

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Commonwealth, for example, Bermuda, Singapore, and the islands of the Indian Ocean, are especially helpful in giving location maps and typical illustrations.

M. O.

Our Scotland. A General and Regional Geography. W. Kinnear and C. G. Wright. 14.5 × 19.5 cm. viii + 152 pp. Edinburgh: Nelson and Sons Ltd. 1956. 6s.

This is an extremely attractive textbook or reference book for about the fourth-year stage in secondary schools, obviously as a pupil's book in Scotland. Several copies would be useful in school libraries in England and Wales, and in "geography room sets", where provided, it would be welcomed. The text, most of it regional studies, is up to date and has a detailed factual basis drawn from trustworthy sources. The illustrations are admirable, with an excellent selection of photographs; reference to the maps is encouraged in the text, and these maps are original, arresting and beautifully drawn. Varied types of diagrams are introduced, including an annotated transect, a chronological diagram-strip of the growth of Glasgow and a block diagram illustrating conditions for the production of hydro-electric power. The opening chapters have references to general physical processes but their usefulness is diminished by some unfortunate shortcomings in the diagrams. The book is well bound, clearly printed and well arranged for private study, being divided into headed paragraphs without breaking the continuity.

F. J. C.

The Clyde Valley. I. Stone. 13.5 × 21 cm. 96 pp. 1956. 6s.

The Forth Valley. G. Dott. 13.5 × 21 cm. 64 pp. 1954. 4s. 6d. Edinburgh: W. and R. Chambers Ltd.

These two books of about third-year standard will be welcomed as textbooks in schools in the two districts and the rest of Scotland; they are also worth a place on library shelves elsewhere. *The Clyde Valley* describes the land, people, history and activities of the Clyde Basin, and has a fine series of illustrations. The addition of production statistics would greatly increase its value as a textbook. *The Forth Valley* considers in simple language the physical, historical and economic geography of the coastlands of the Firth and of the lower Forth valley. Illustrations include photographs, diagrams, line drawings and a helpful geological sketchmap of the district.

F. J. C.

The following books, which may be consulted by members, have been received or purchased by the Library of the Association.

Recent Archaeological Excavations in Britain. Selected excavations 1939-1955 with a chapter on recent air-reconnaissance. Edited by R. L. S. Bruce-Mitford. 310 pp. London: Routledge and Kegan Paul. 1956.

Wales. A Physical, Historical and Regional Geography. Edited by E. G. Bowen. 528 pp. London: Methuen and Co. Ltd. 1957. (To be reviewed in a later issue of *Geography*.)

Guide to the Geology of the East Midlands. University of Nottingham. 1948. 6s.

The Common Lands of Hampshire. L. E. Tavener. Published by Hampshire County Council. Obtainable from the Clerk of the County Council, The Castle, Winchester. 1957. 21s. Includes 3 folded maps: Half-inch coloured topographical map of Hampshire; Parish index map of Hampshire Commons, ¼-inch scale; geology of Hampshire, ¼-inch scale.

Northumbrian Tweedside. The Rural Problem. J. W. House. Cyclostyled, 66 pp. Newcastle: Northumberland Rural Community Council, 26 Trafalgar Street, Newcastle upon Tyne 1. 1956. 5s.

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